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USDA Foreign Agricultural Service

Afghanistan: Crop Progress Report

MY 2010/11

March Summary

March 31, 2010

- (1) The current outlook for Afghanistan's MY 2010/11 wheat crop is favorable, with early indications of well-above average production potential. At this point, crops have broken dormancy and are in the early stages of primary vegetative development. Rainfall conditions during the next two months will dictate the direction of overall crop production. Whether or not the country will achieve a second consecutive record wheat harvest will depend on timely rains and sufficient irrigation supplies. The 2010 winter snowpack has already been significantly depleted, owing to a period of rapid melt in late February and early March during an early spring heatwave. As a result, it appears that irrigation supplies will be more limited this year and irrigated wheat yields may decline. Rainfed agricultural areas are generally in very good condition, having recently emerged from underneath heavy snow. The recent snowmelt has left large areas with favorable soil moisture supplies, ensuring that early crop emergence and growth will be strong. The rainfed regions, however, will require substantial additional spring rainfall to achieve yields near last year's levels.
- (2) Cumulative rainfall was very favorable from September-December in most major grain producing regions (northwest, north and northeast), enabling farmers to plant their crops in a timely manner and for soils to build up modest amounts of stored moisture for seed germination and early growth. These unusually favorable rains created one of the best starts to the wheat growing season in many years. The weather pattern changed in Mid-December and dry warm conditions prevailed through January. These unfavorable conditions resulted in well-below normal seasonal snowfall, at a time when maximum winter accumulations are expected. Overall there have been favorable seasonal moisture conditions nationwide, except for the west central and extreme southwestern regions (Figure 1). Normal or better than normal total seasonal precipitation has occurred over all major grain producing areas with the exception of portions of Faryab, Sar-e Pul, Bamyán, and Ghor (Figure 2). Temperatures have been well-above normal since mid-February, and continue to be seasonably high throughout the country at the time of this report (Figure 3). These excessive seasonal temperatures caused a rapid and early loss of valuable snowcover, and may have depleted regional soil moisture reserves where crops were exposed.
- (3) In January and early February satellite derived NDVI data indicated that the MY2010/11 wheat crop was better developed than both last year and the 6-year average in all major grain growing areas except the Eastern regions. By late March the crop situation appears less promising. Most major rainfed crop areas in Afghanistan are displaying normal or slightly better than normal vegetative development, however many irrigated areas in the prime wheat producing regions of the northwest, north, and northeast appear to be less well-developed. These regions were blanketed with snow during February, and it is possible that crop

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development was temporarily delayed, that plant population in fields is less dense than last year, or that the snowcover caused slight vegetative damage. The northwest provinces Farah, Herat and Badghis are currently displaying similar vegetative conditions to the six year average, but are significantly lower than last year. In the north and northeast, particularly around Mazar-e Sharif, Baghlan, and Kunduz, vegetative crop development in prime irrigated lands are low compared to both last year and the six year average. Figures 9 through 24 show current regional level NDVI analysis of wheat crop conditions. Outside of the northern regions of Afghanistan current NDVI analysis is similar to previous months with near-normal vegetation conditions in the south and east-central provinces; worse than normal conditions in eastern provinces of Kunar and Nangarhar; and especially better than normal conditions in the southwest along the Helmand River. The best NDVI evidence of crop production potential occurs during peak crop growth in April to early May (Figure 4).

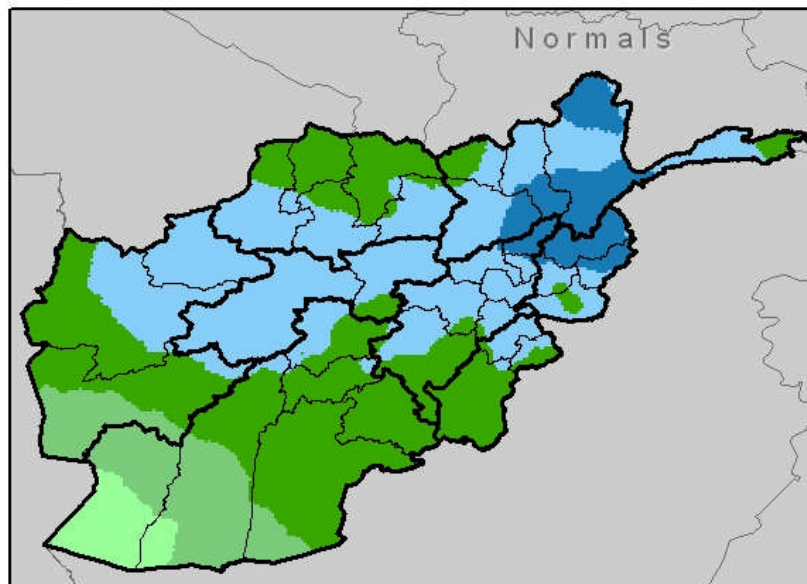
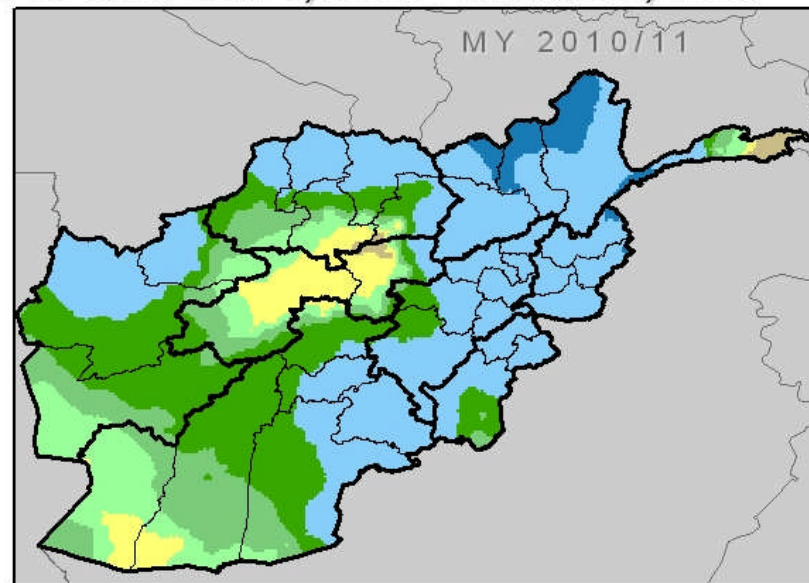
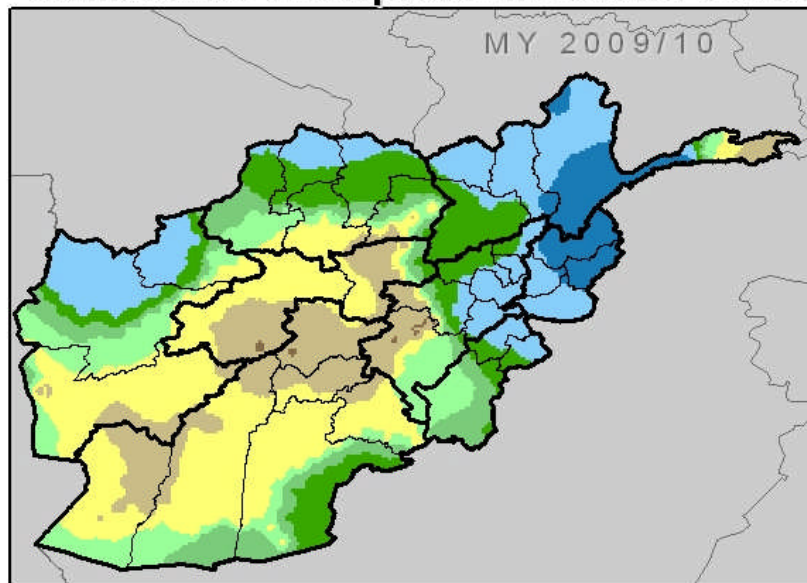
- (4) An extremely low winter snowpack in January 2010 caused a great deal of concern over Afghanistan's upcoming MY2010/11 wheat crop prospects, as 70 percent of national production emanates from irrigated farmland and snowmelt is the primary source of irrigation water supply. Weather fronts in late January and February, however, blanketed many regions in new snow and brought the national snowpack back to near normal levels. Unfortunately, a strong heatwave occurred from late February through late March, causing a rapid depletion of the existing snowcover and complicating the wheat crop outlook. At this point in time, it appears that overall irrigation supplies for the MY 2010/11 wheat crop will be less than last year, and that crop yields will be lower as a result. The national snow covered area as of March 21, 2010 is lower than last year, while snow depth analysis also indicates a lower than average snow pack in the south and west-central regions (Figures 32 and 33). An estimated 88 percent of irrigation water supply for crop production in Afghanistan is derived from the surface water that flows through the country's river basins, and both surface and ground water recharge in the country is directly linked to spring snow melt out of the Hindu Kush Mountains. Water availability for crop production is a factor of the amount available through snow melt (snow water equivalence) and the rate of snow melt. Last year (MY 2009/10), snow availability was very good, and the rate of melting was near ideal. This ensured that irrigated wheat crops had an even flow of available water during all critical moisture sensitive growth phases, and resulted in record crop yields. By comparison, though the MY 2008/09 season started with high snowpack levels, a sustained spring weather pattern of dry and hot conditions caused rapid snowpack melting. The rapid melt caused most of the runoff to occur before the irrigated wheat crop was established and could benefit from it. Later in the season, when crop yield potential was determined, there was little or no irrigation available and crop yields suffered significant declines. Given the current snowpack situation in Afghanistan, the MY 2010/11 crop season is shaping up to fall somewhere between the extremes of the past two year (record drought losses in MY 2008/09 and record crop production from MY 2009/10).
- (5) The NOAA Climate Prediction Center's 7-day rainfall forecast indicates additional light to moderate rainfall will occur in the next week across the north and northeast portions of Afghanistan (Figure 35). The higher precipitation expected over the rainfed grain areas of Faryab, Sar-e Pul, and Samangan provinces will be especially helpful as season-to-date

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precipitation in those areas has been below normal.

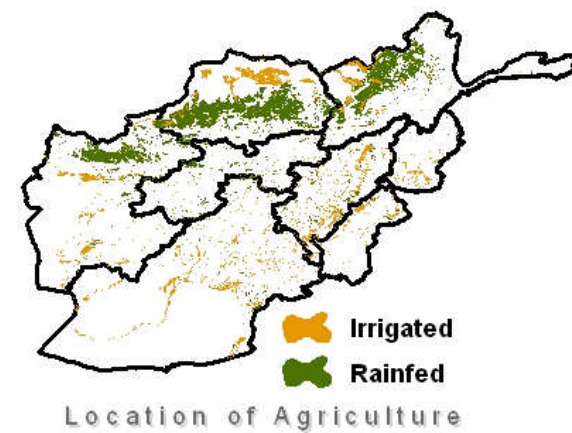
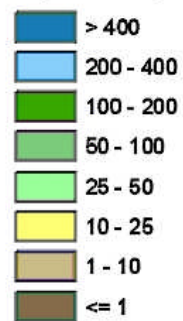
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Cumulative Precipitation: Grains Season to date Oct. 1, 2009 - March 20, 2009



Precipitation (mm)



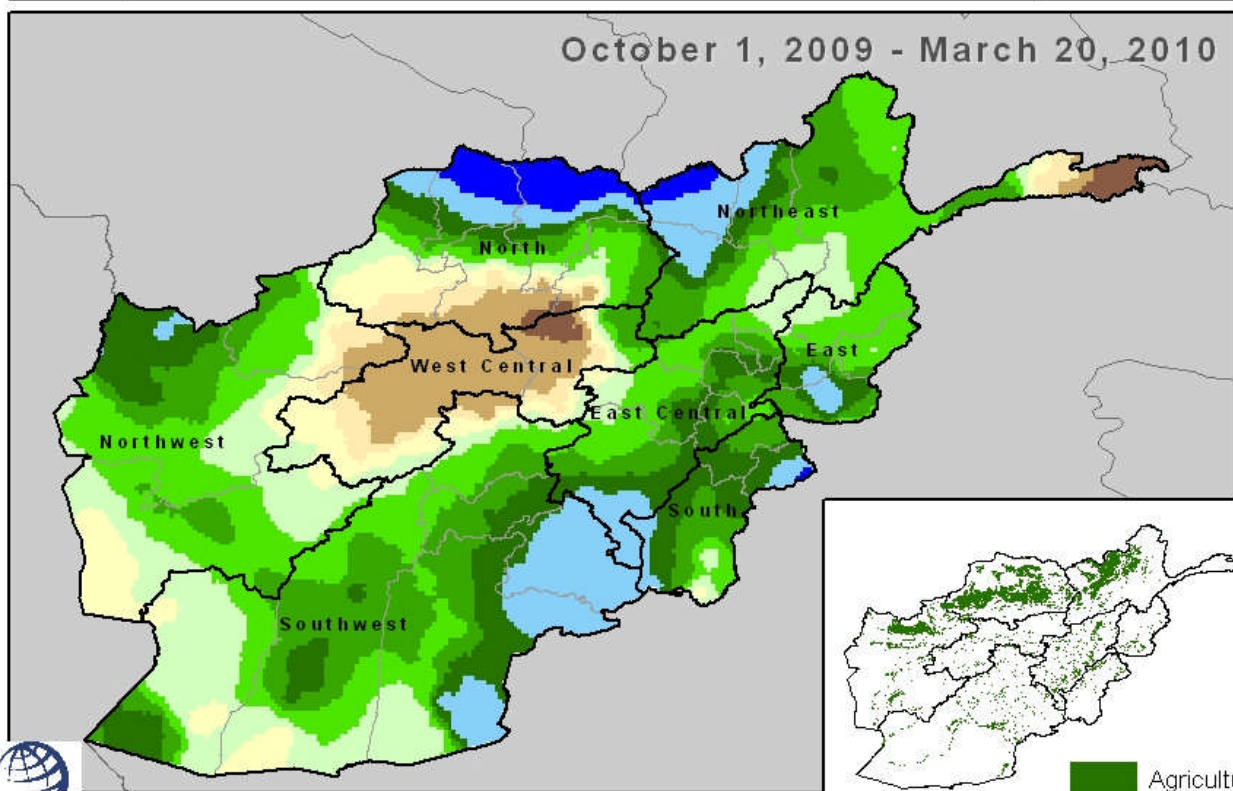
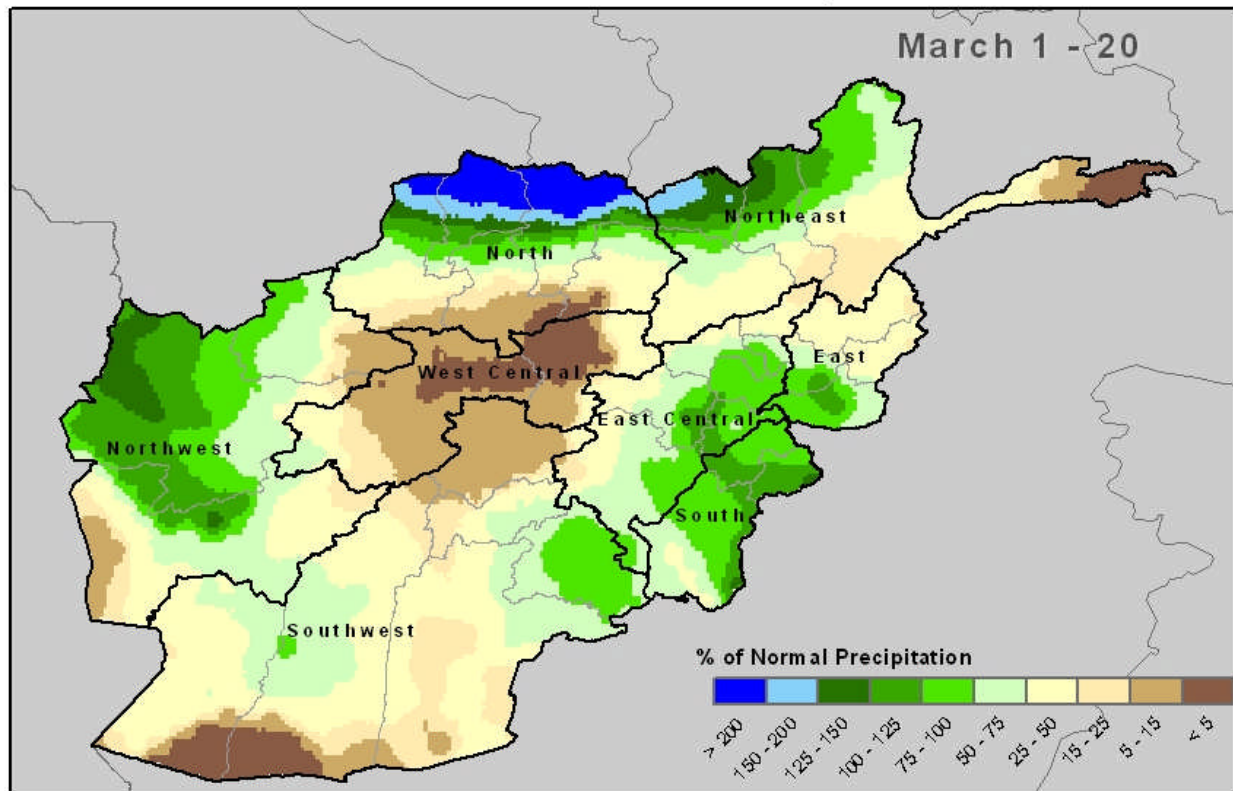
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Figure 1. Season to date cumulative precipitation showing current year (MY 2010/11) compared against the previous years and precipitation normals.

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Percent of Normal Precipitation



Data Source: AFWA Precipitation
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer

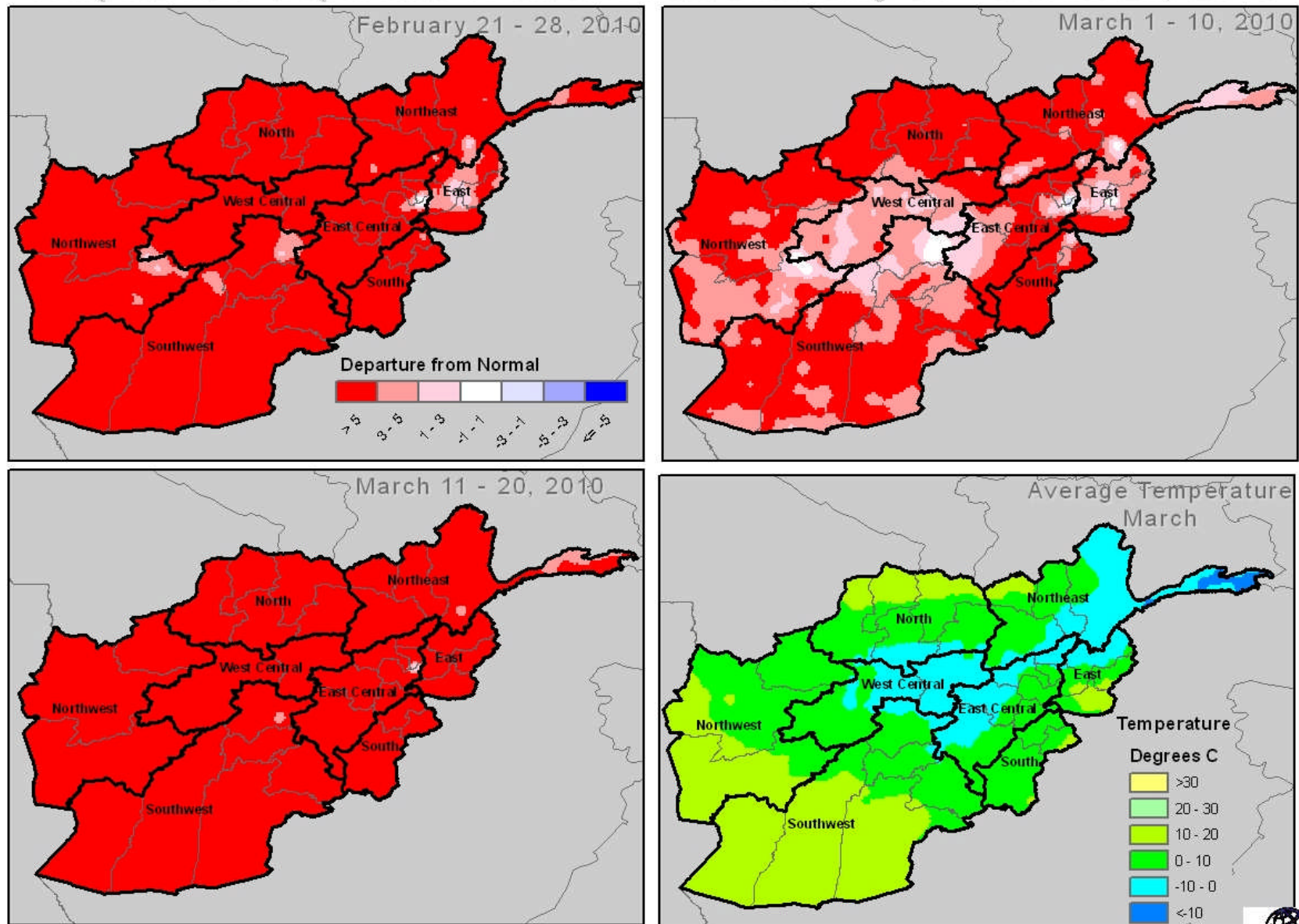
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Figure 2. Percent of normal precipitation showing the current month and winter grains season to date.

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Temperature Departure from Normal: February 21 - March 20, 2010



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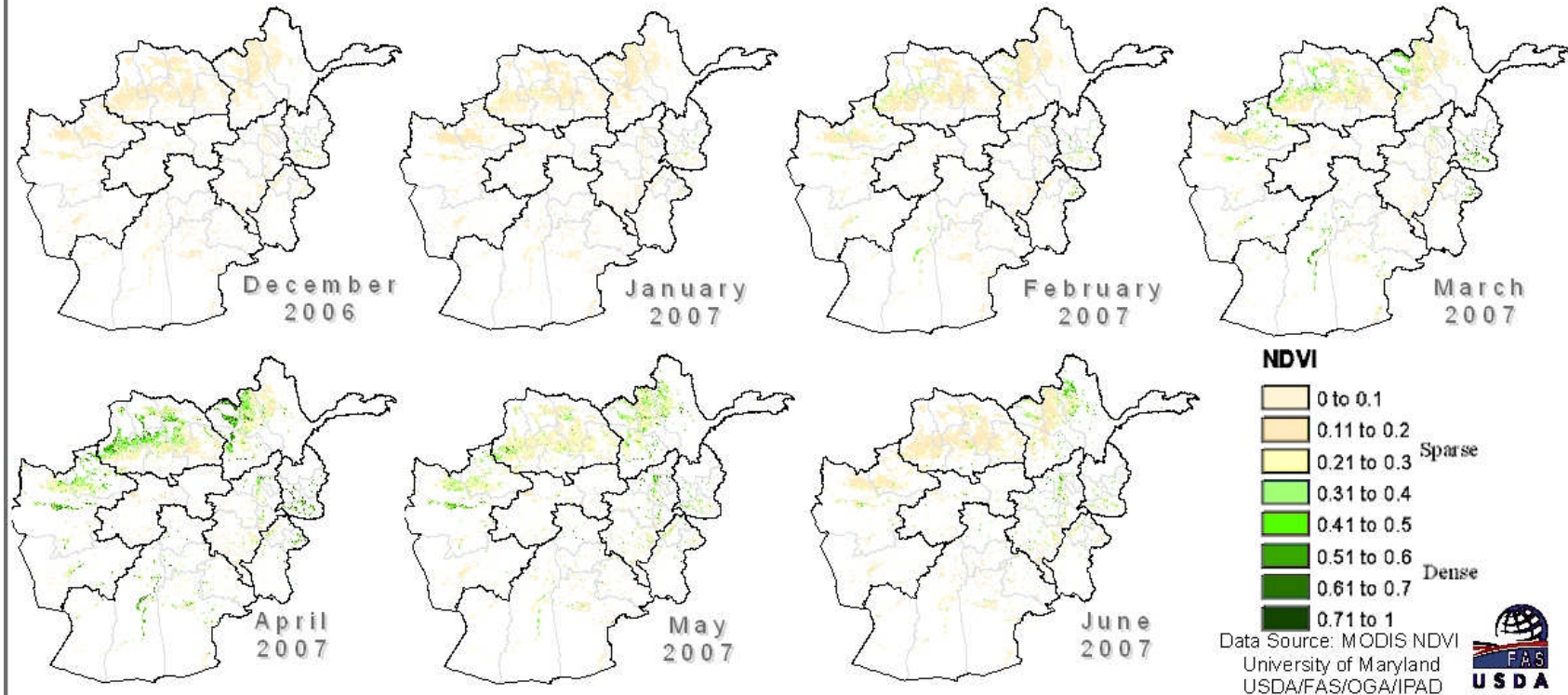
Figure 3. Decadal temperature departure from normal from January 20, 2010 to February 20, 2010

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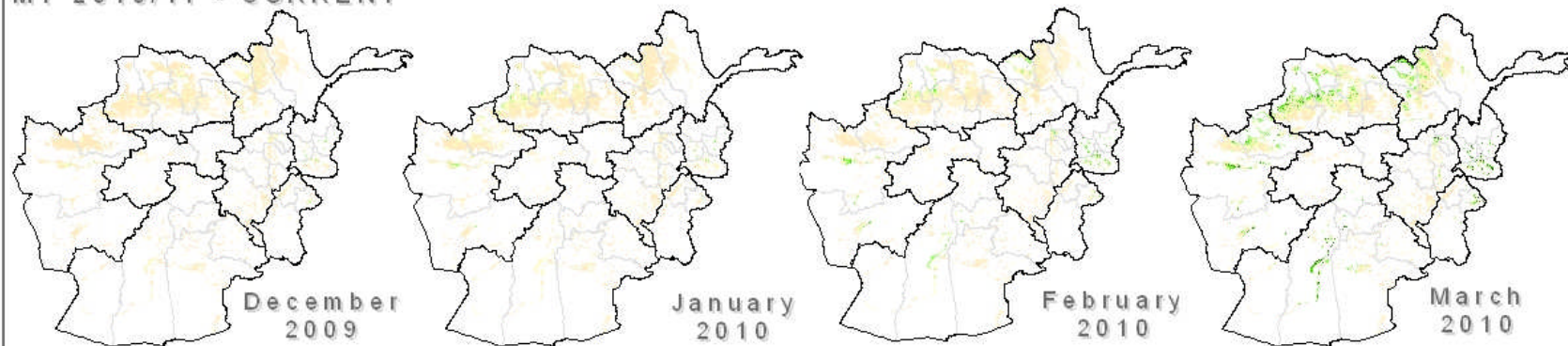
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MODIS NDVI Time Series: MY 2010/11 vs. MY 2007/08 Benchmark

MY 2007/08 - BENCHMARK



MY 2010/11 - CURRENT



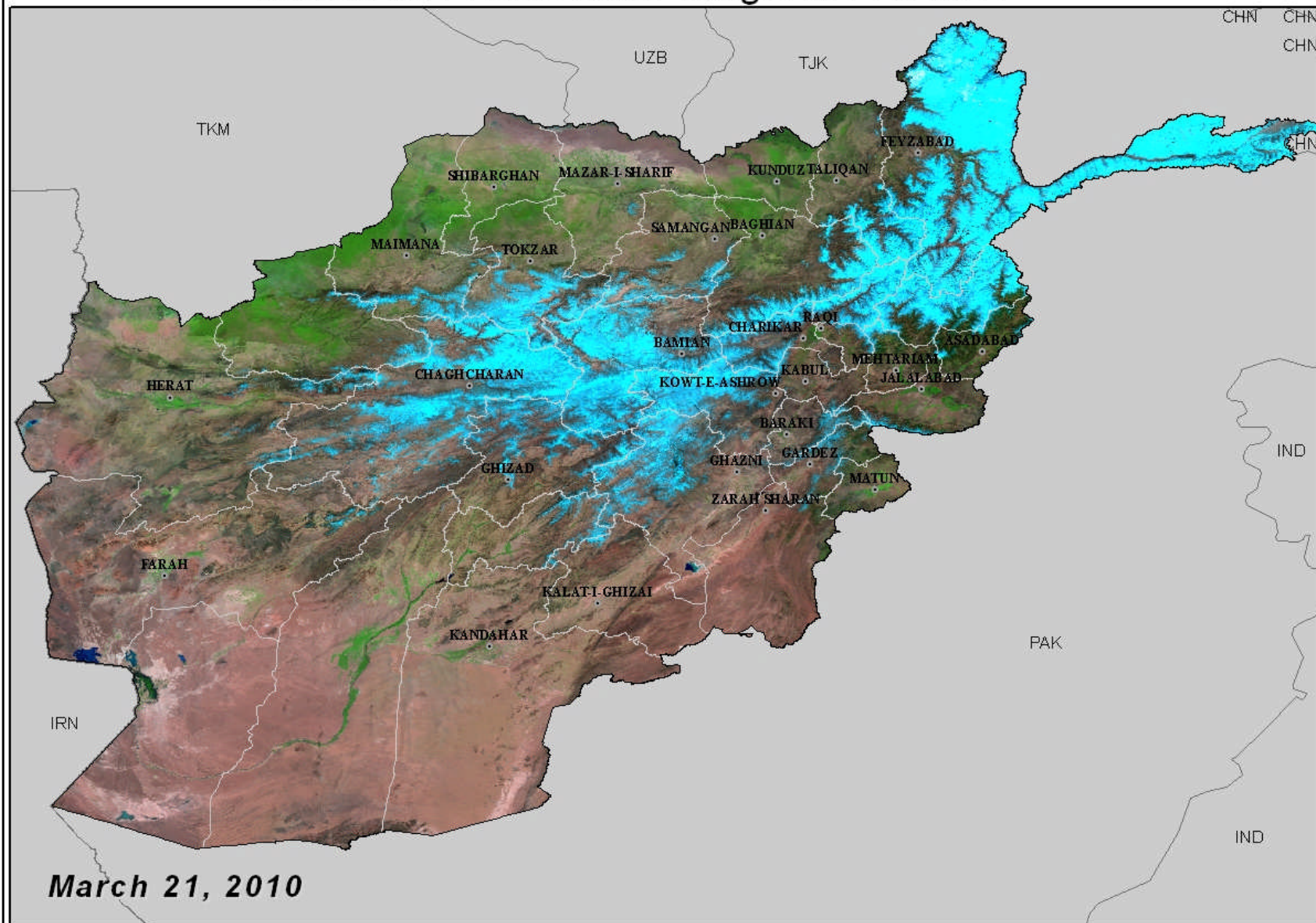
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Figure 4. MODIS NDVI images over the winter grains season comparing MY 2007/08 benchmark grain production year to the current season.

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MODIS 721 False-Color Image: MY 2010/11



Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

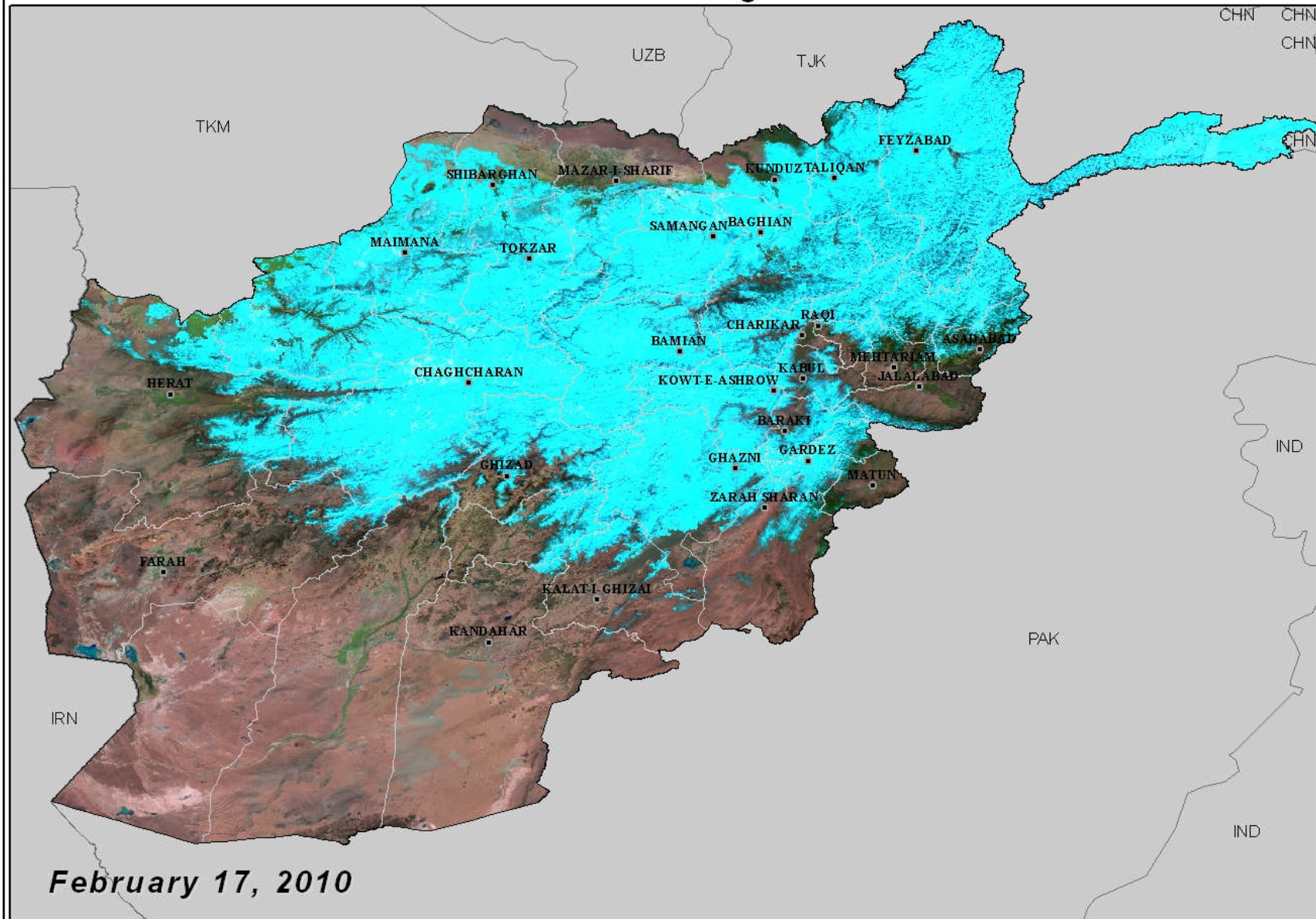
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Figure 5. MODIS false color, cloud free composite over Afghanistan for the current month, March 14 - 21, 2010

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MODIS 721 False-Color Image: MY 2010/11



February 17, 2010

Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

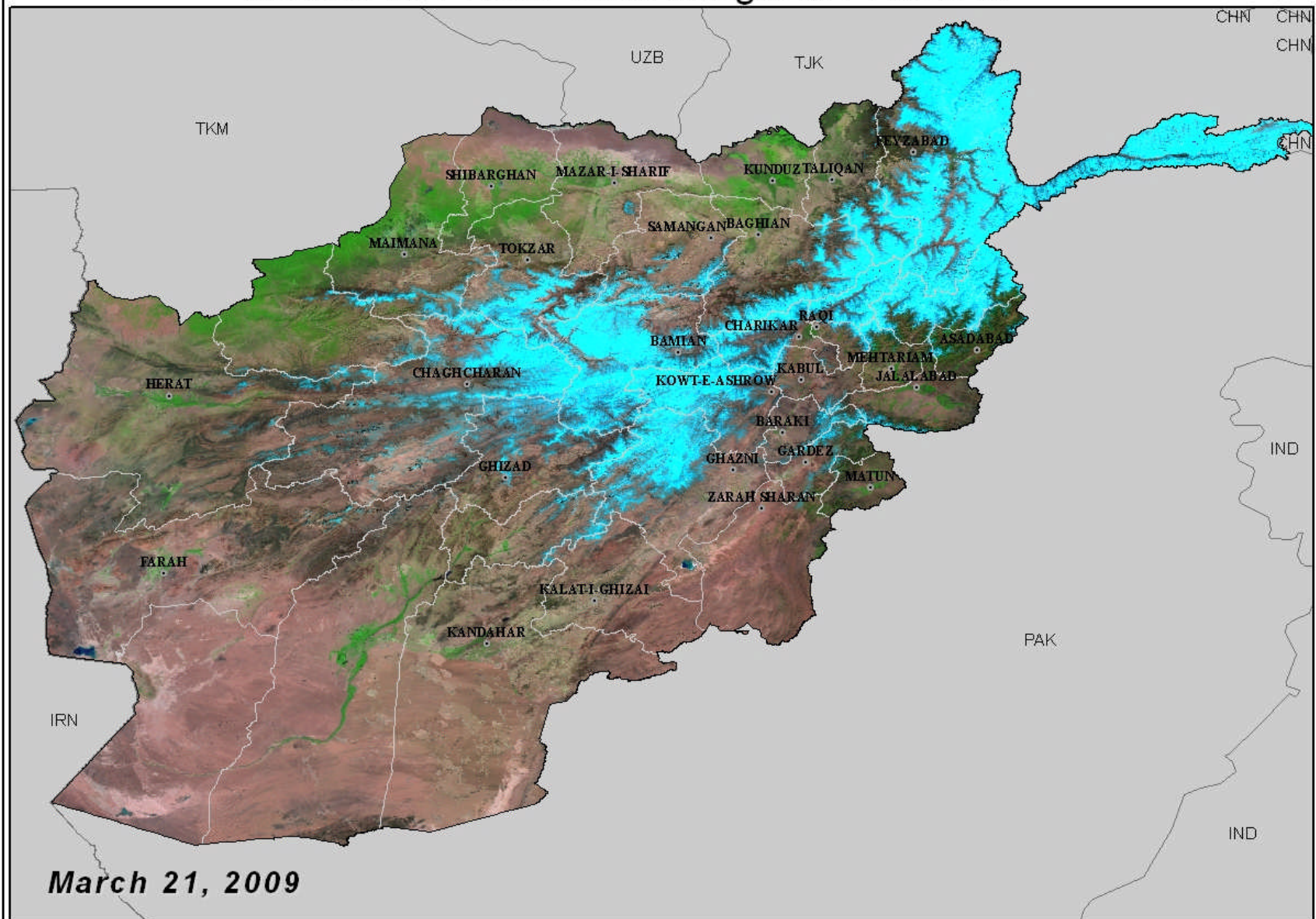
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Figure 6. MODIS false color, cloud free composite over Afghanistan for the previous month, February 10-17, 2010

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MODIS 721 False-Color Image: MY 2009/10



Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

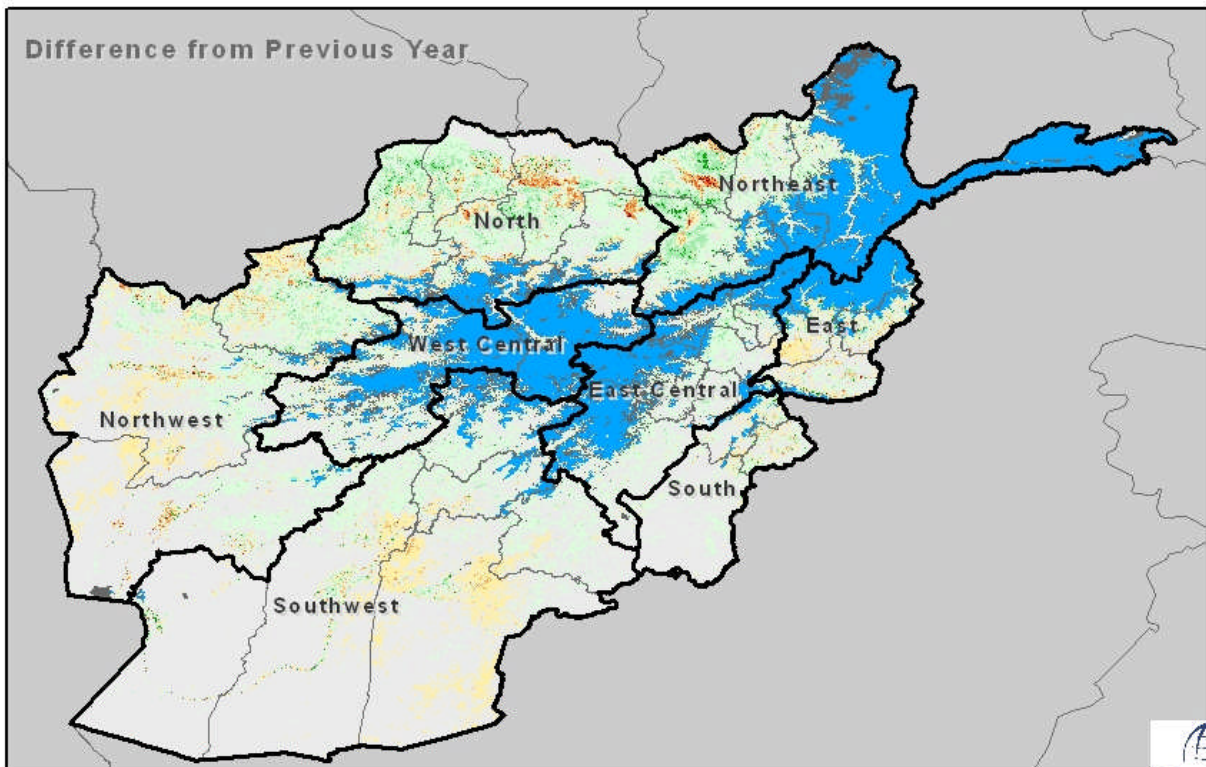
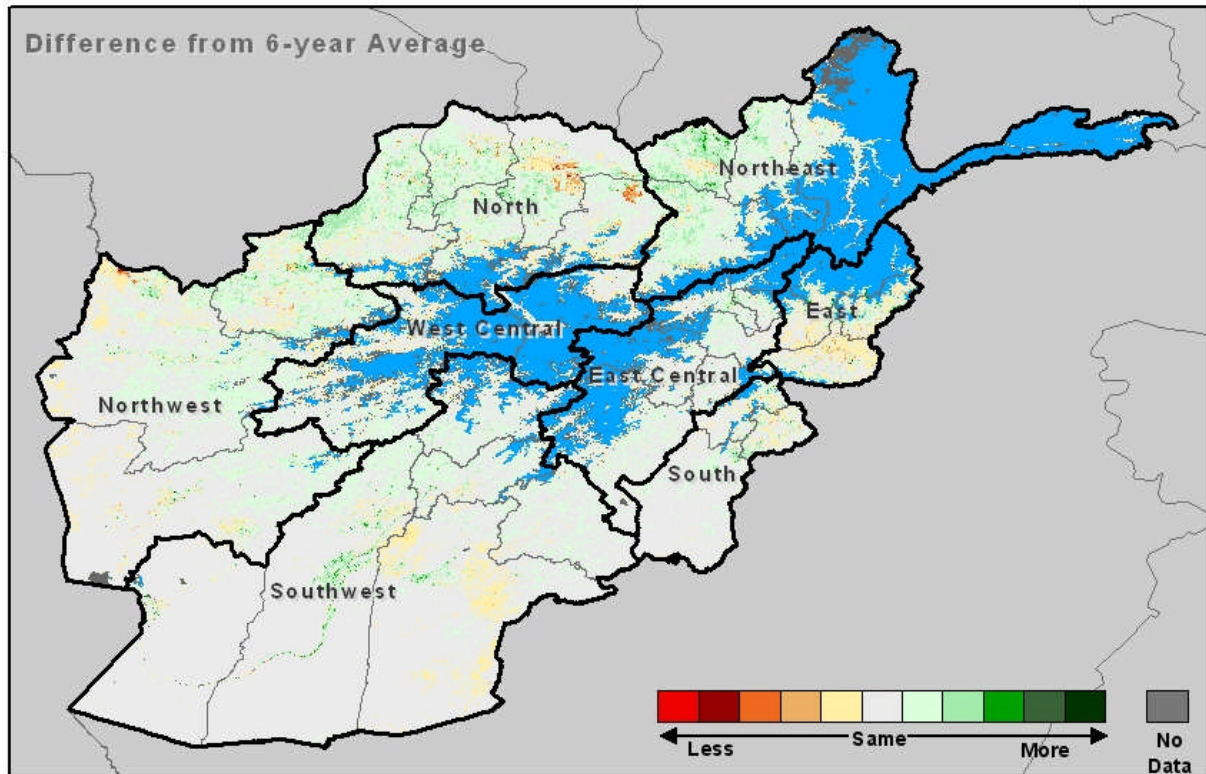
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Figure 7. MODIS false color, cloud free composite over Afghanistan for the current month, last year March 14 - 21, 2009

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MODIS NDVI Change Analysis: March 21, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



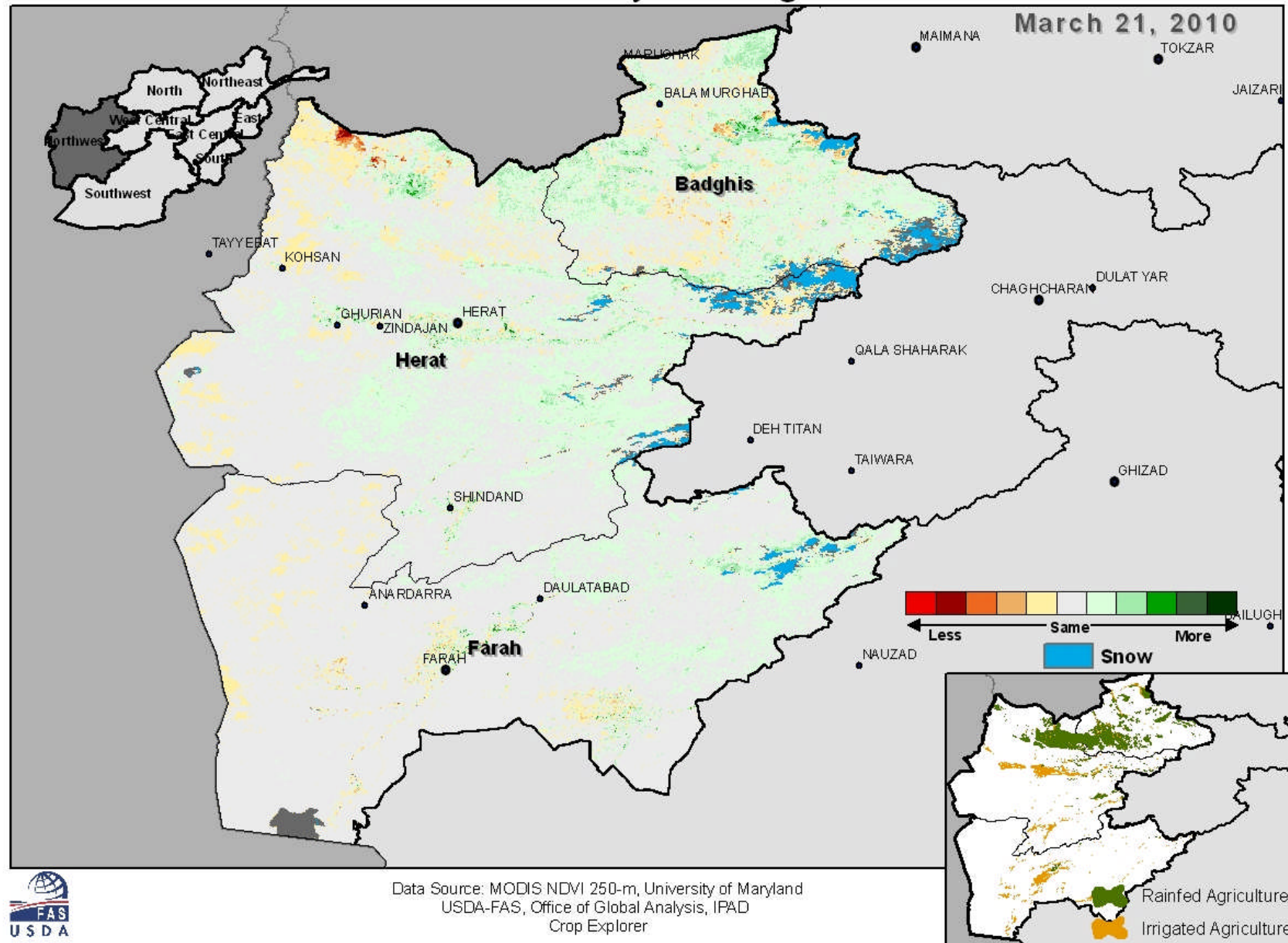
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Figure 8. MODIS NDVI change comparing current MY 2010/11 NDVI against the previous 6-year average and against the previous season (MY 2009/10)

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MODIS NDVI Difference from 6yr Average: Northwest Provinces



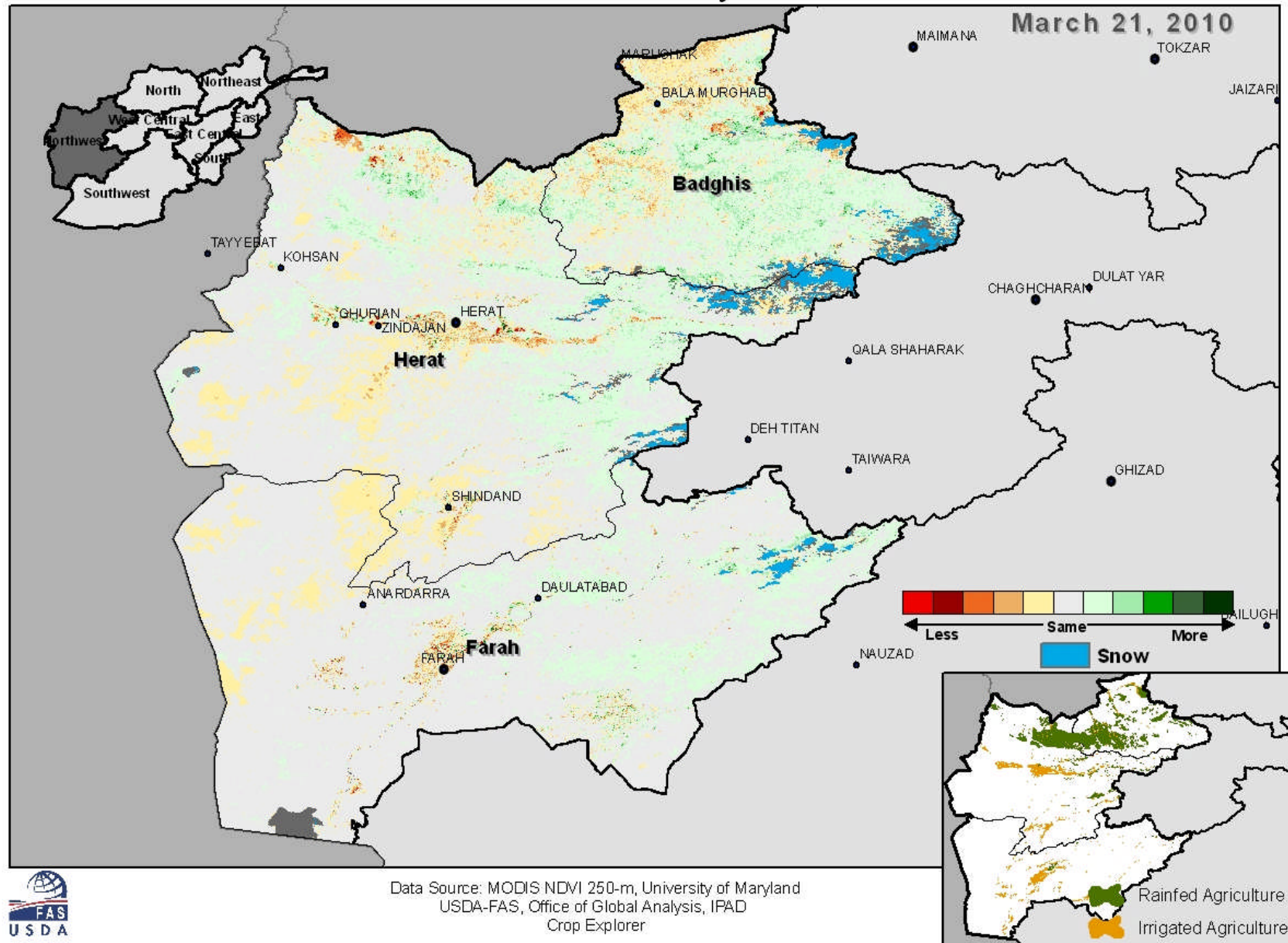
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Figure 9. MODIS NDVI comparing current conditions against previous 6-year average, Northwest Provinces

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MODIS NDVI Difference from Last year: Northwest Provinces



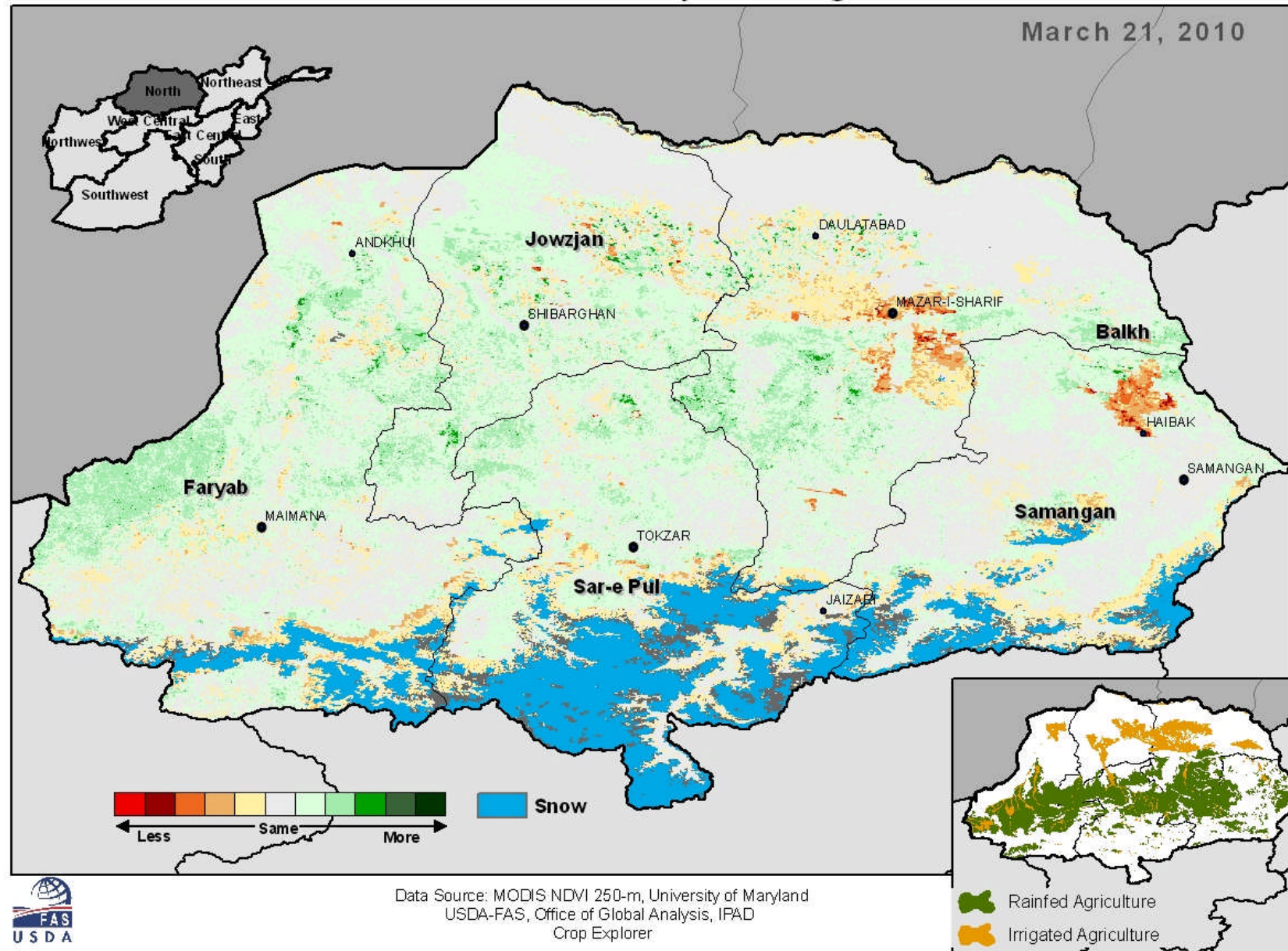
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Figure 10. MODIS NDVI comparing current conditions against previous season (MY 2009/10), Northwest Provinces

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MODIS NDVI Difference from 6yr Average: North Provinces



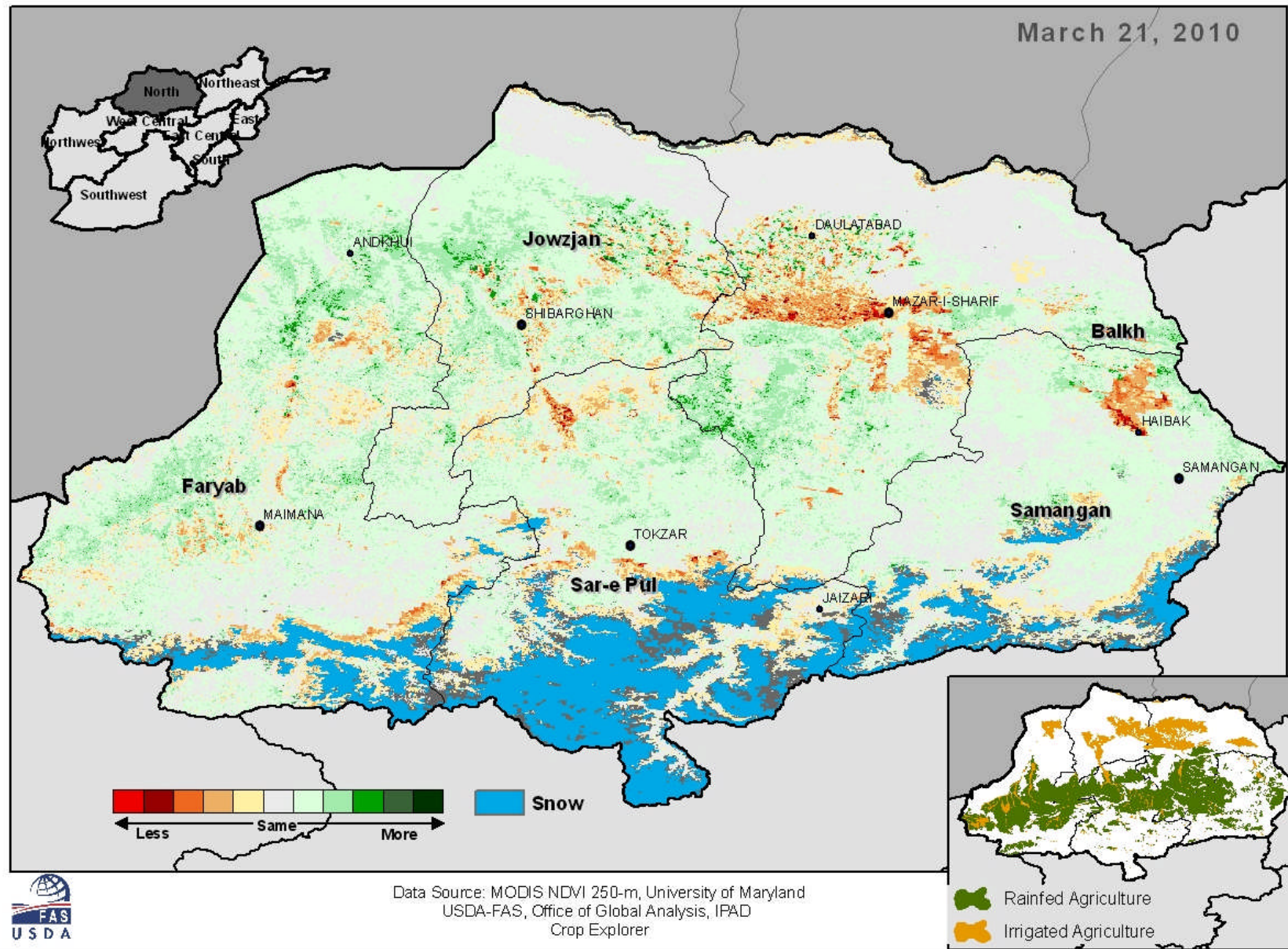
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Figure 11. MODIS NDVI comparing current conditions against previous 6-year average, North Provinces

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MODIS NDVI Difference from Last Year: North Provinces



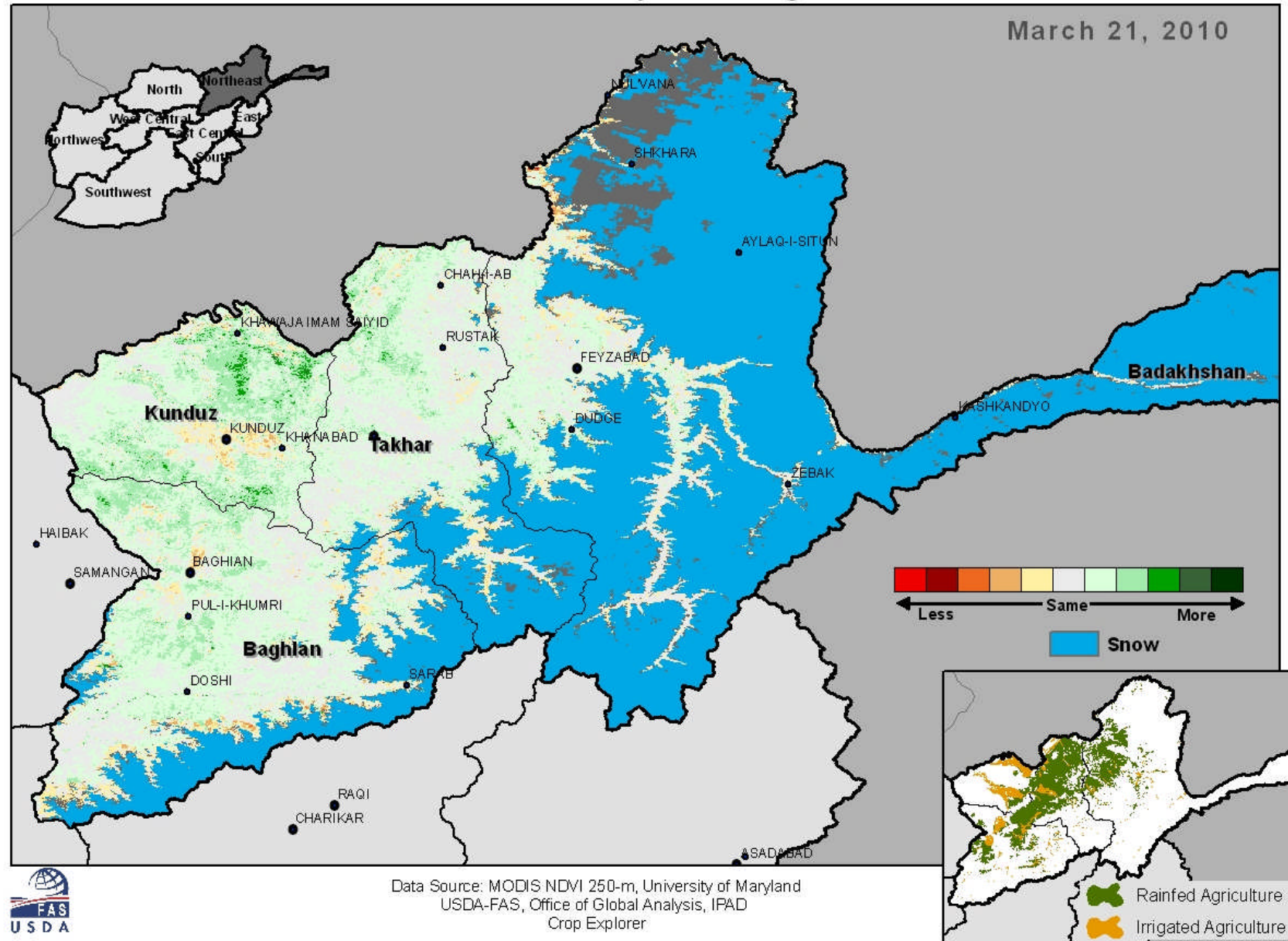
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Figure 12. MODIS NDVI comparing current conditions against previous season (MY 2009/10), North Provinces

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MODIS NDVI Difference from 6yr Average: Northeast Provinces



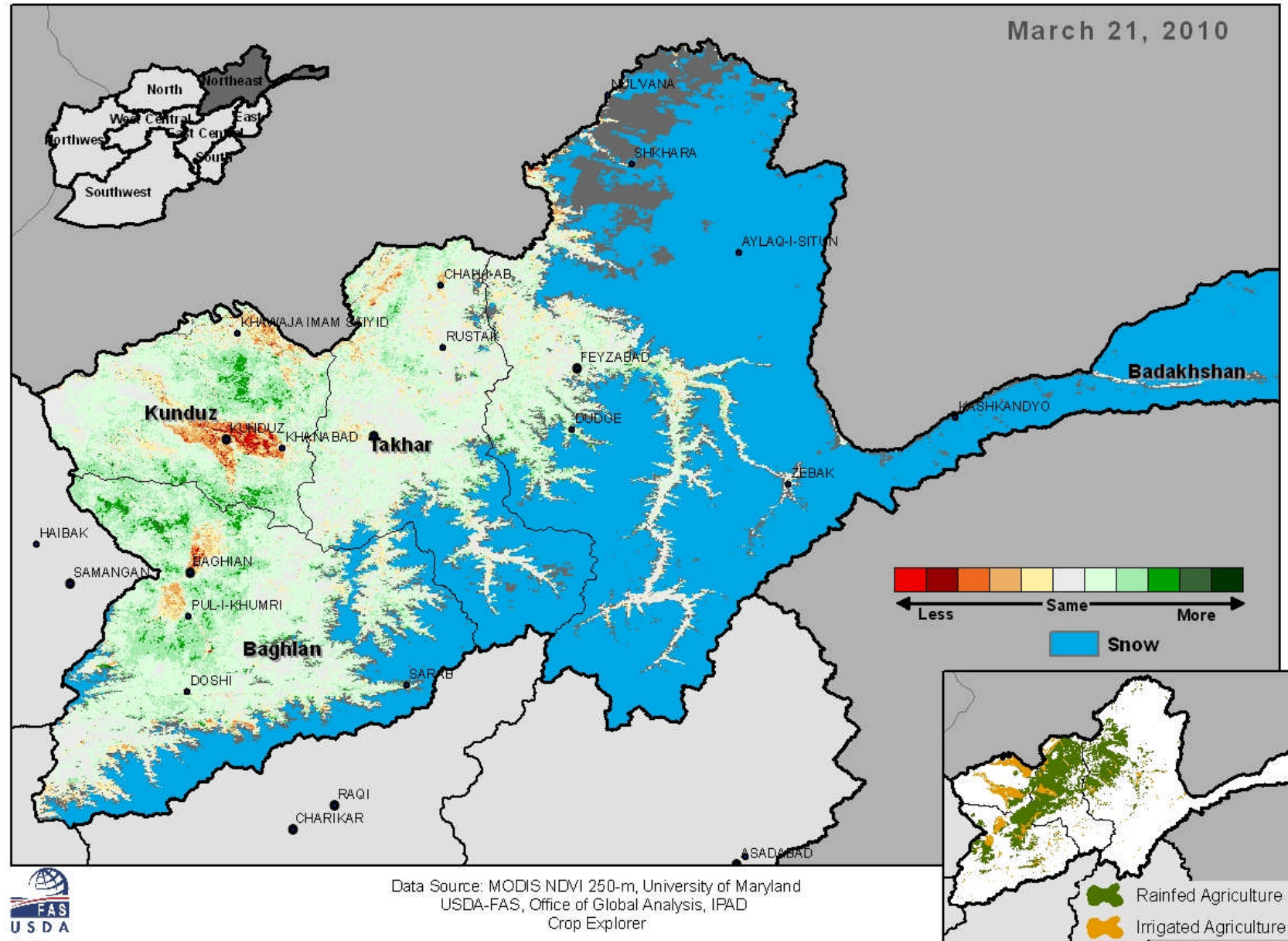
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Figure 13. MODIS NDVI comparing current conditions against previous 6-year average, Northeast Provinces

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MODIS NDVI Difference from Last Year: Northeast Provinces



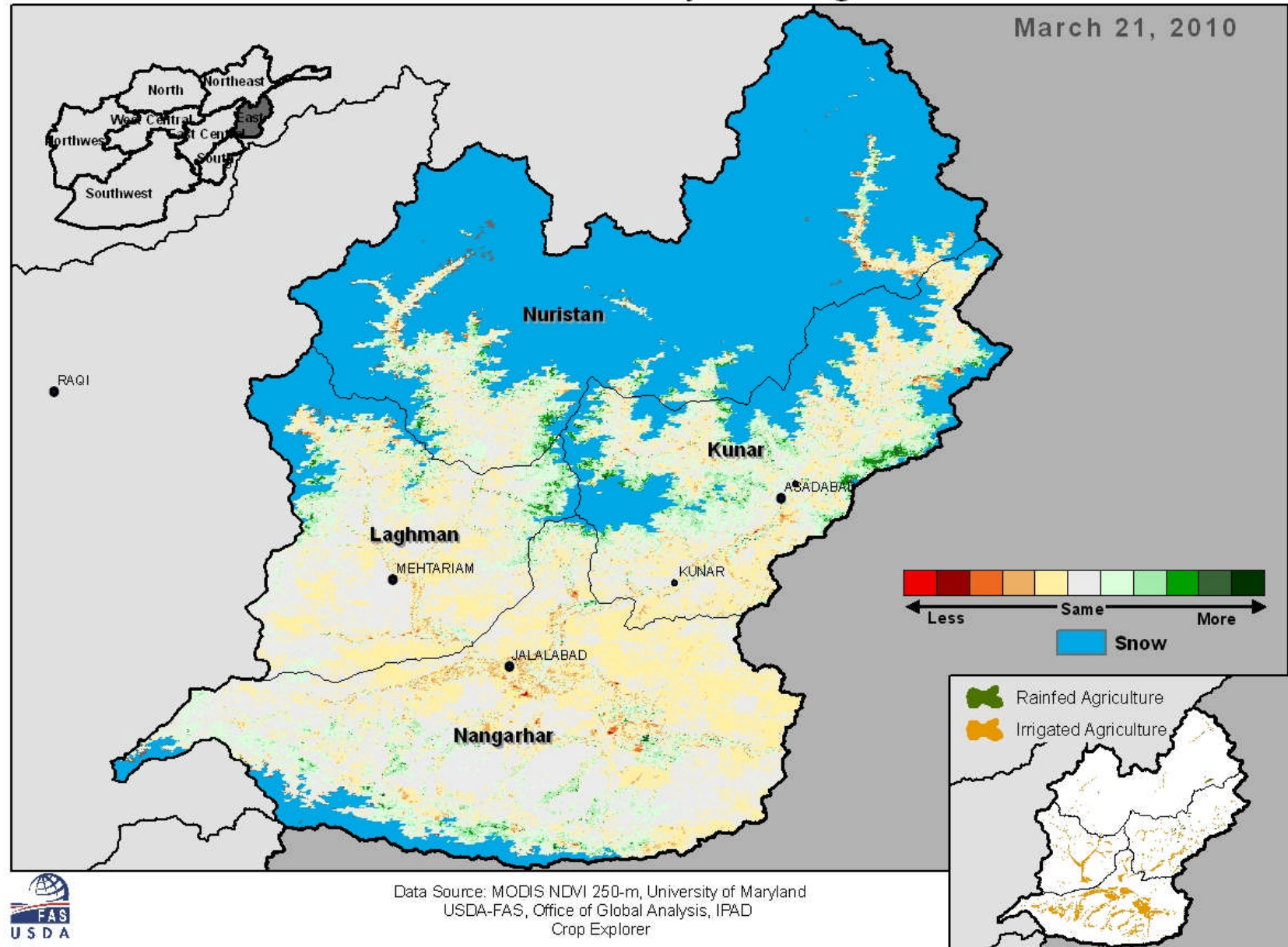
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Figure 14. MODIS NDVI comparing current conditions against previous season (MY 2009/10), Northeast Provinces

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MODIS NDVI Difference from 6yr Average: East Provinces



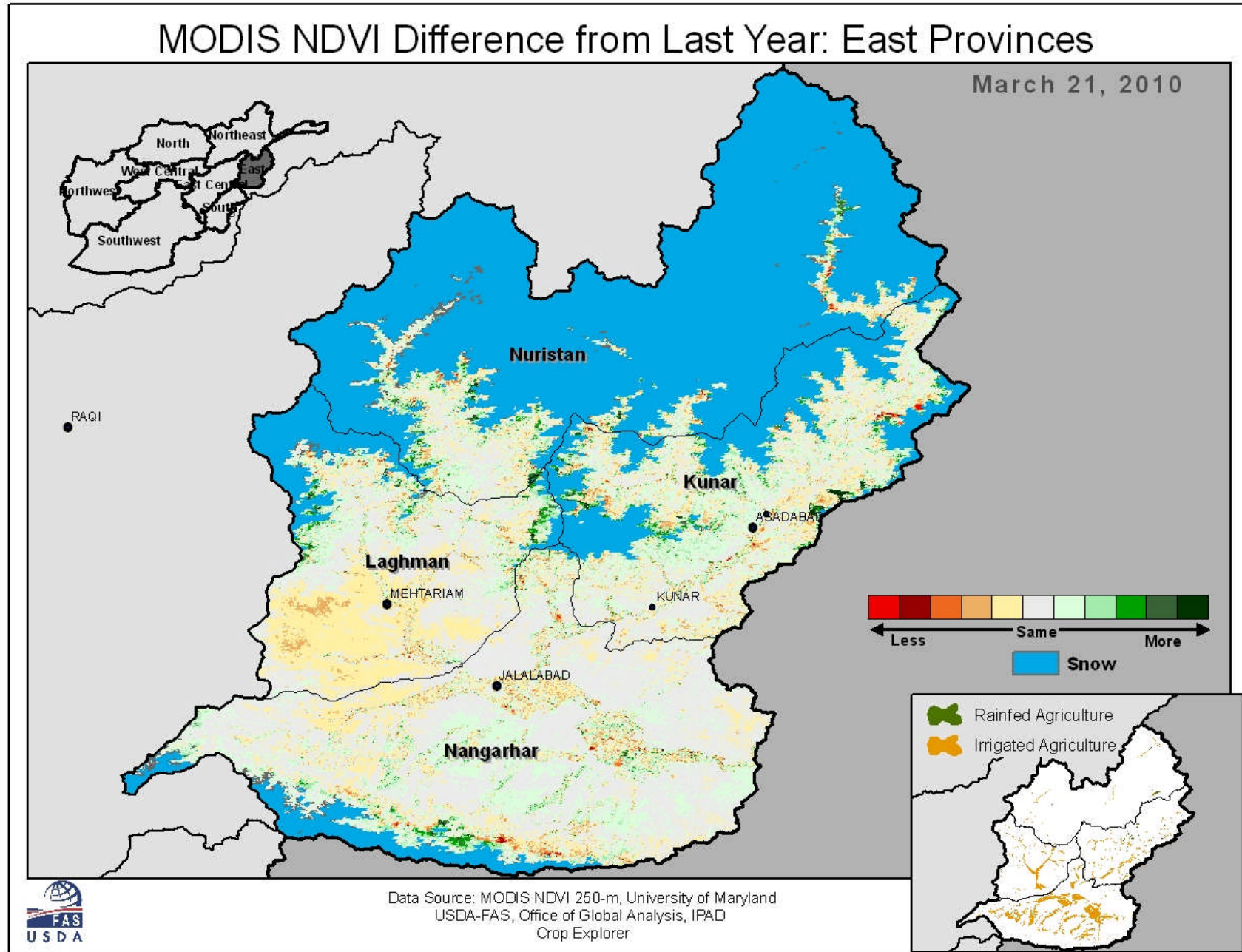
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Figure 15. MODIS NDVI comparing current conditions against previous 6-year average, East Provinces

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MODIS NDVI Difference from Last Year: East Provinces



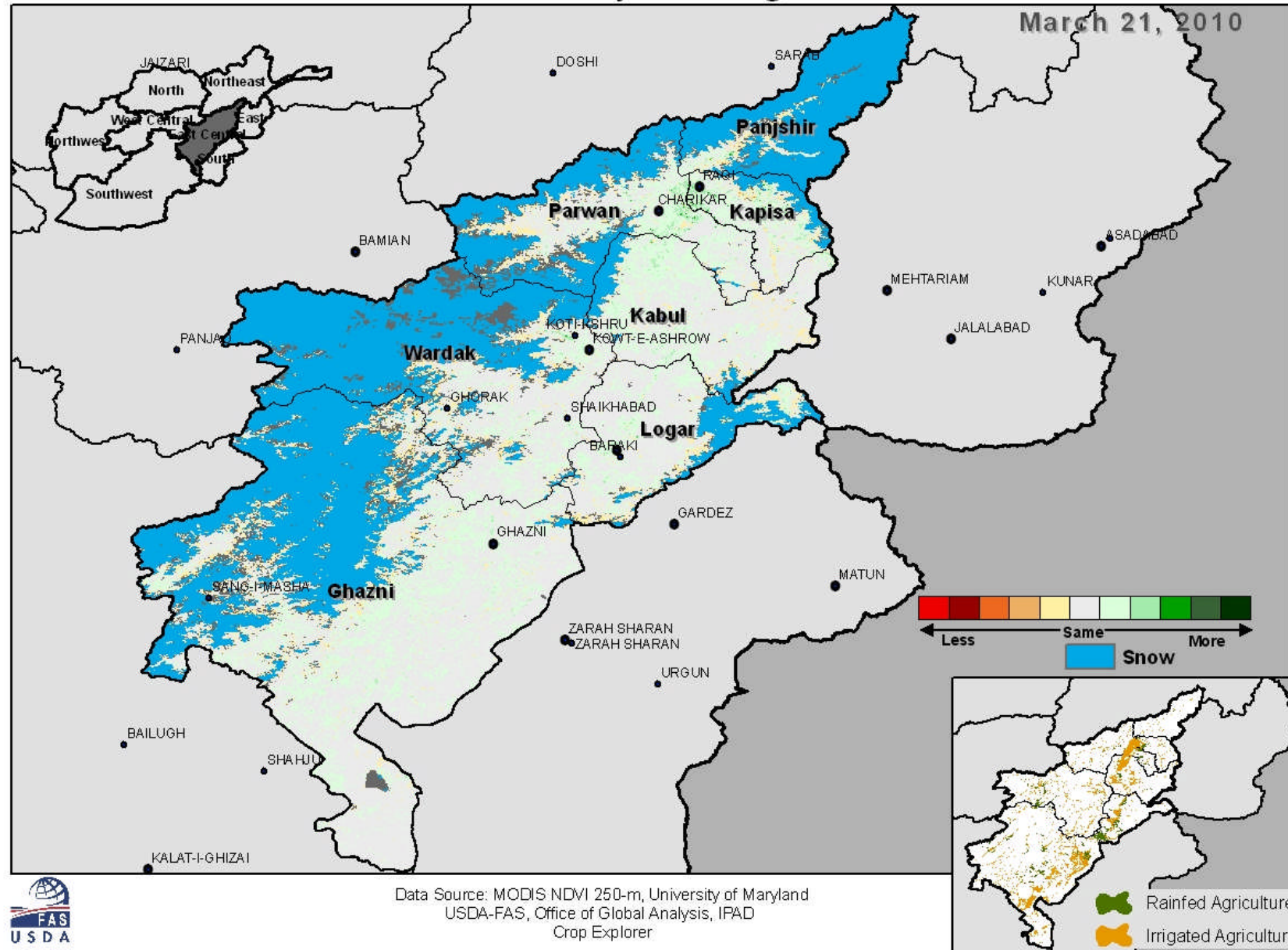
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Figure 16. MODIS NDVI comparing current conditions against previous season (MY 2009/10), East Provinces

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MODIS NDVI Difference from 6yr Average: East Central Provinces



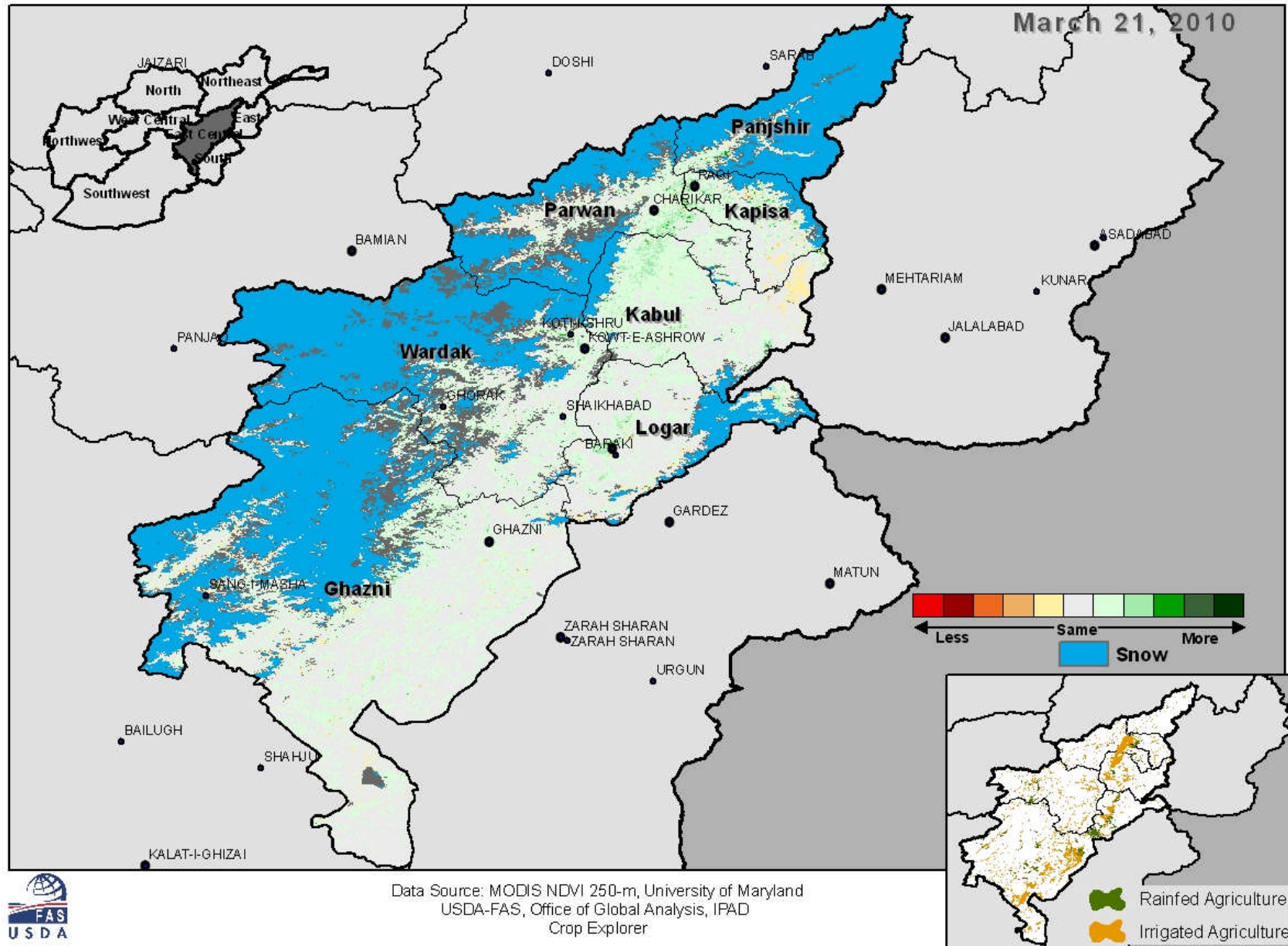
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Figure 17. MODIS NDVI comparing current conditions against previous 6-year average, East Central Provinces

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MODIS NDVI Difference from Last Year: East Central Provinces



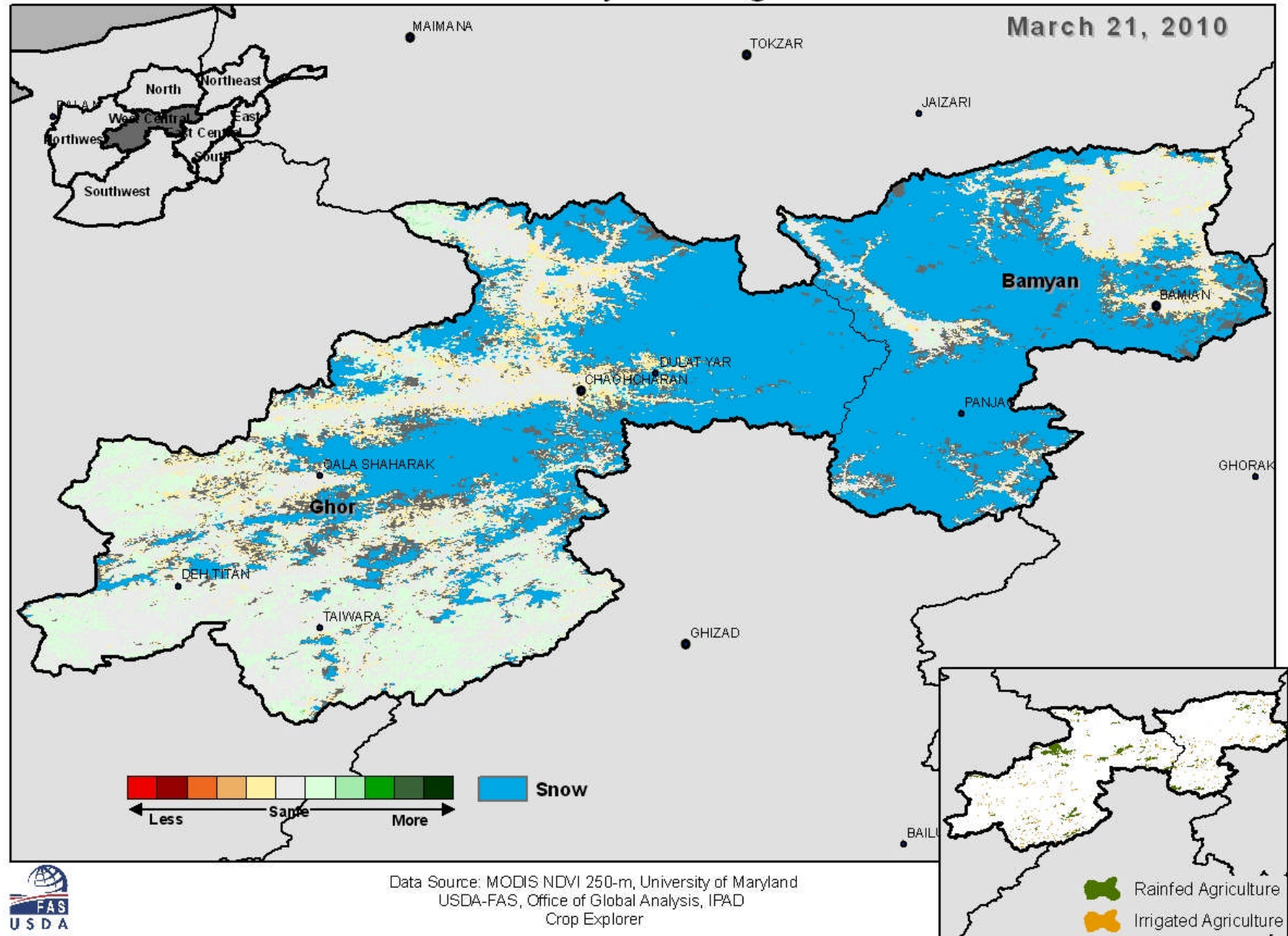
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Figure 18. MODIS NDVI comparing current conditions against previous season (MY 2009/10), East Central Provinces

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MODIS NDVI Difference from 6yr Average: West Central Provinces

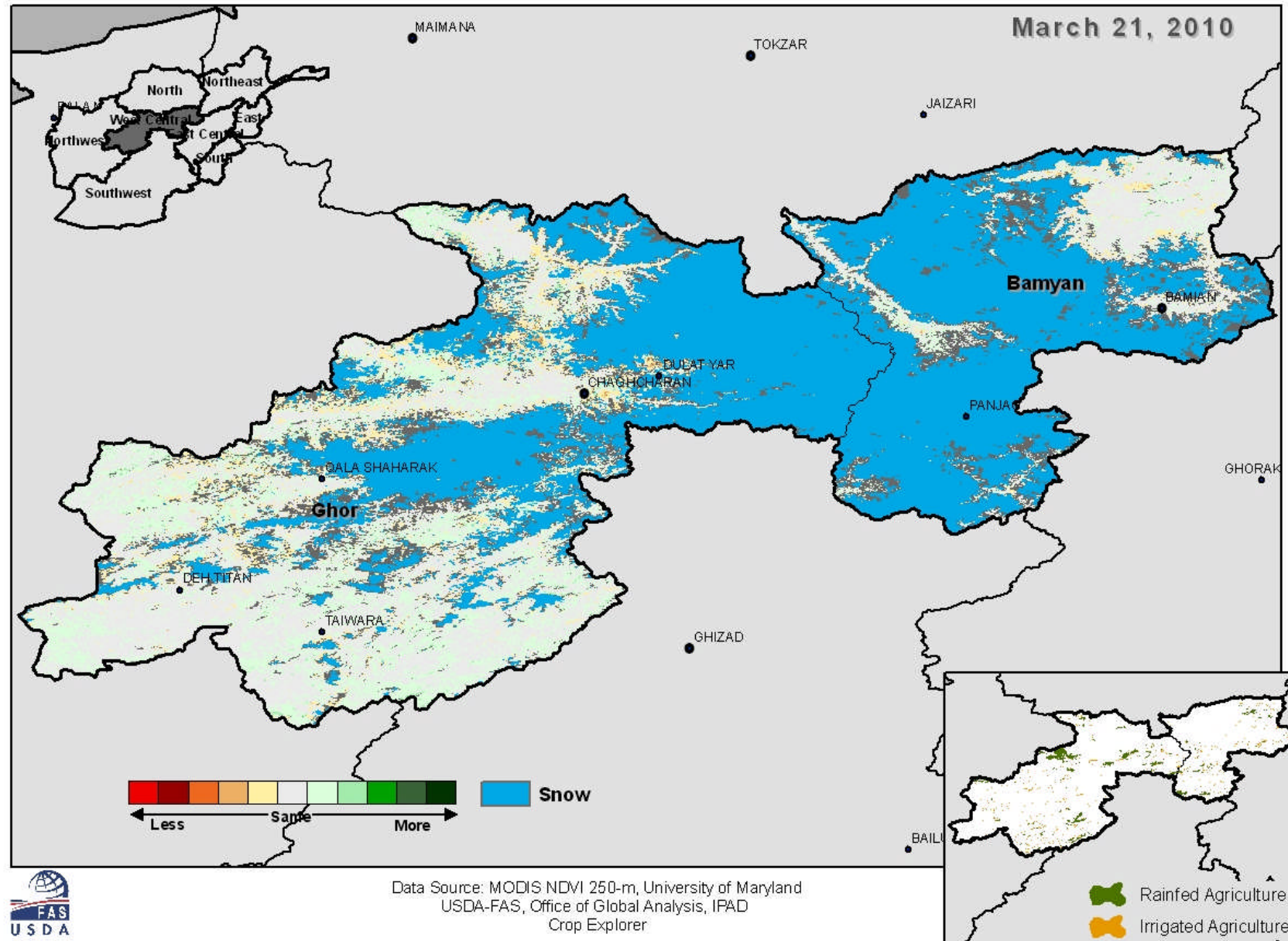


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Figure 19. MODIS NDVI comparing current conditions against previous 6-year average, West Central Provinces

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MODIS NDVI Difference from Last Year: West Central Provinces



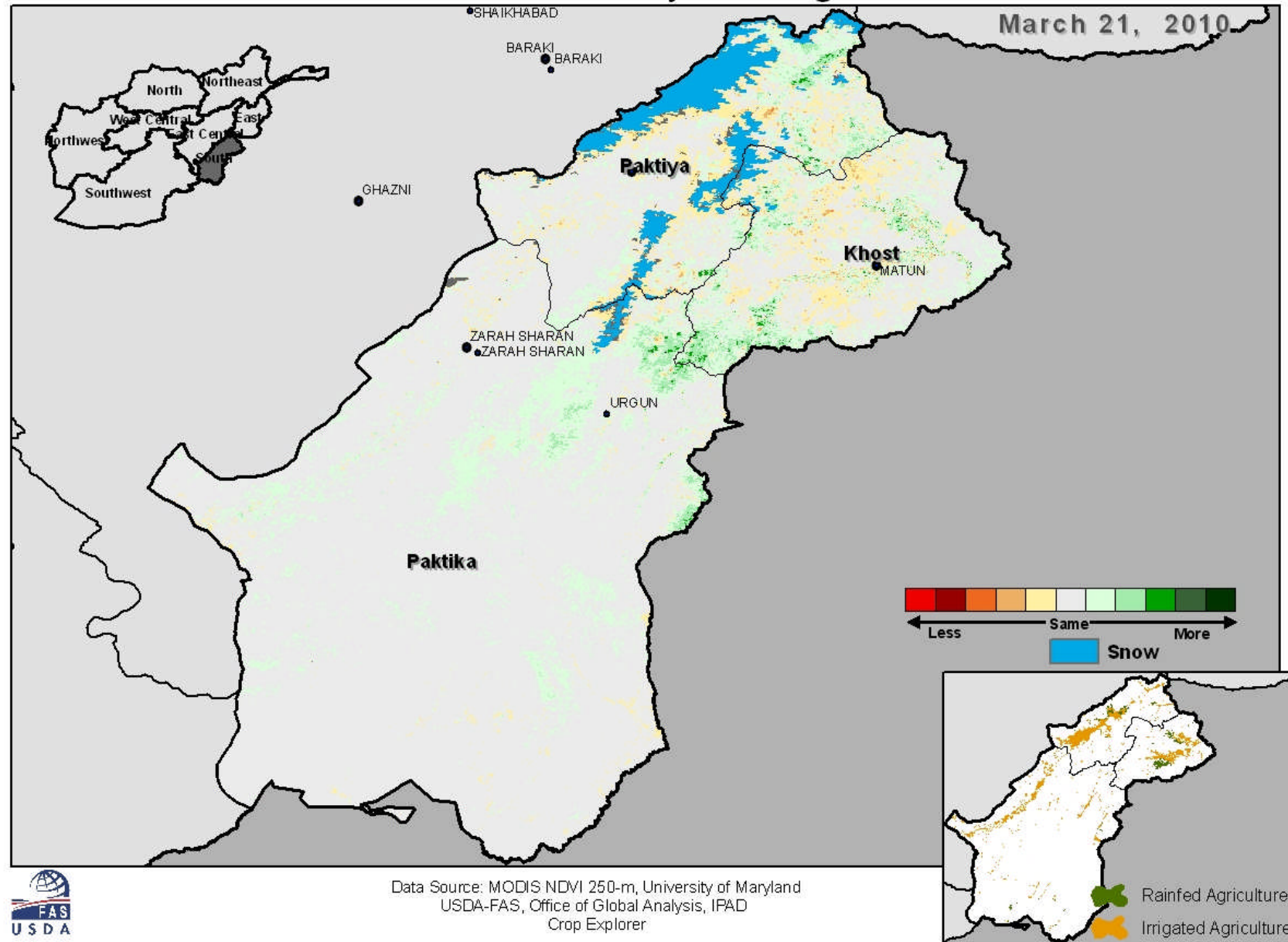
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Figure 20. MODIS NDVI comparing current conditions against previous season (MY 2009/10), West Central Provinces

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MODIS NDVI Difference from 6yr Average: South Provinces



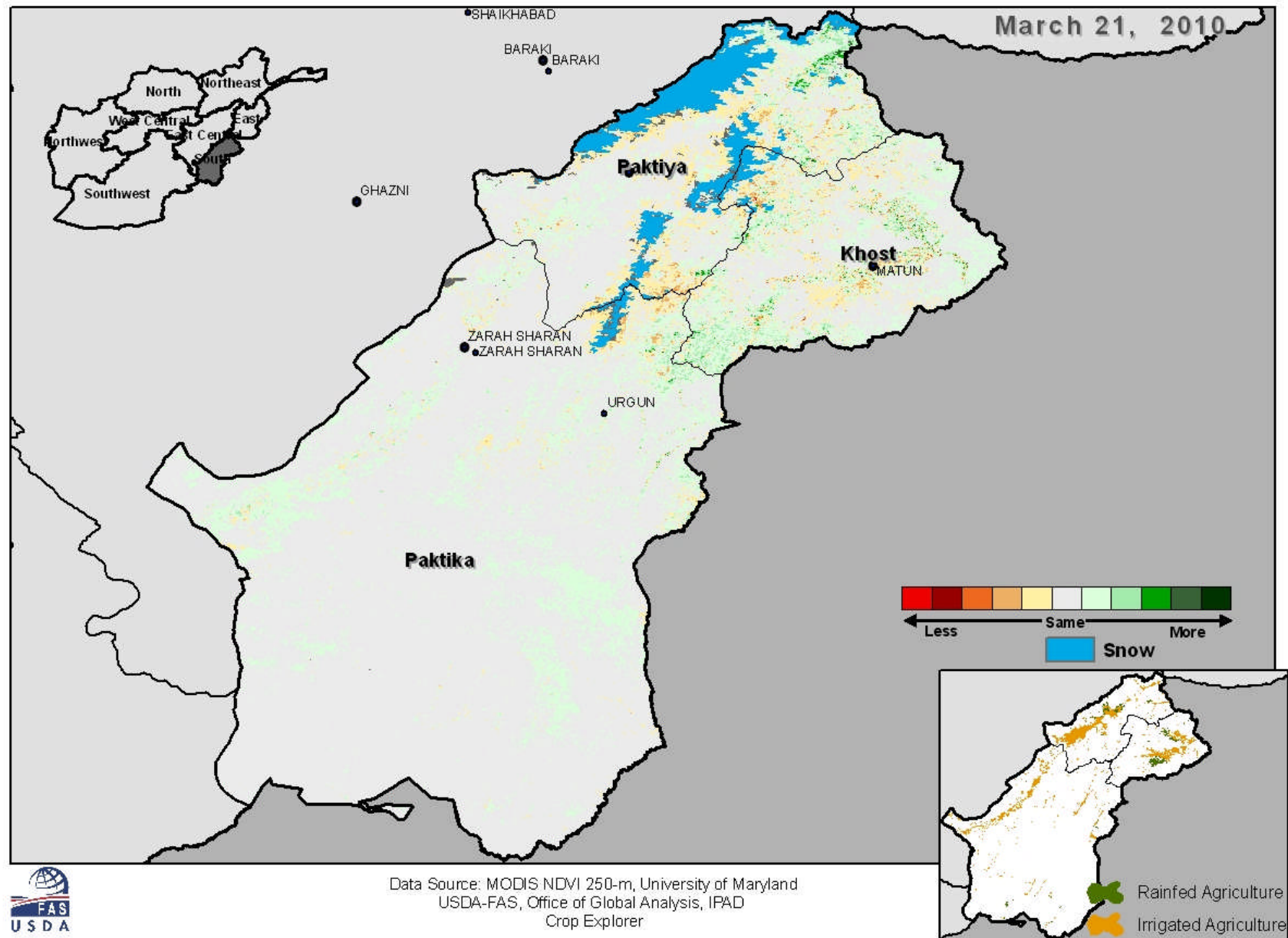
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Figure 21. MODIS NDVI comparing current conditions against previous 6-year average, South Provinces

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MODIS NDVI Difference from Last Year: South Provinces



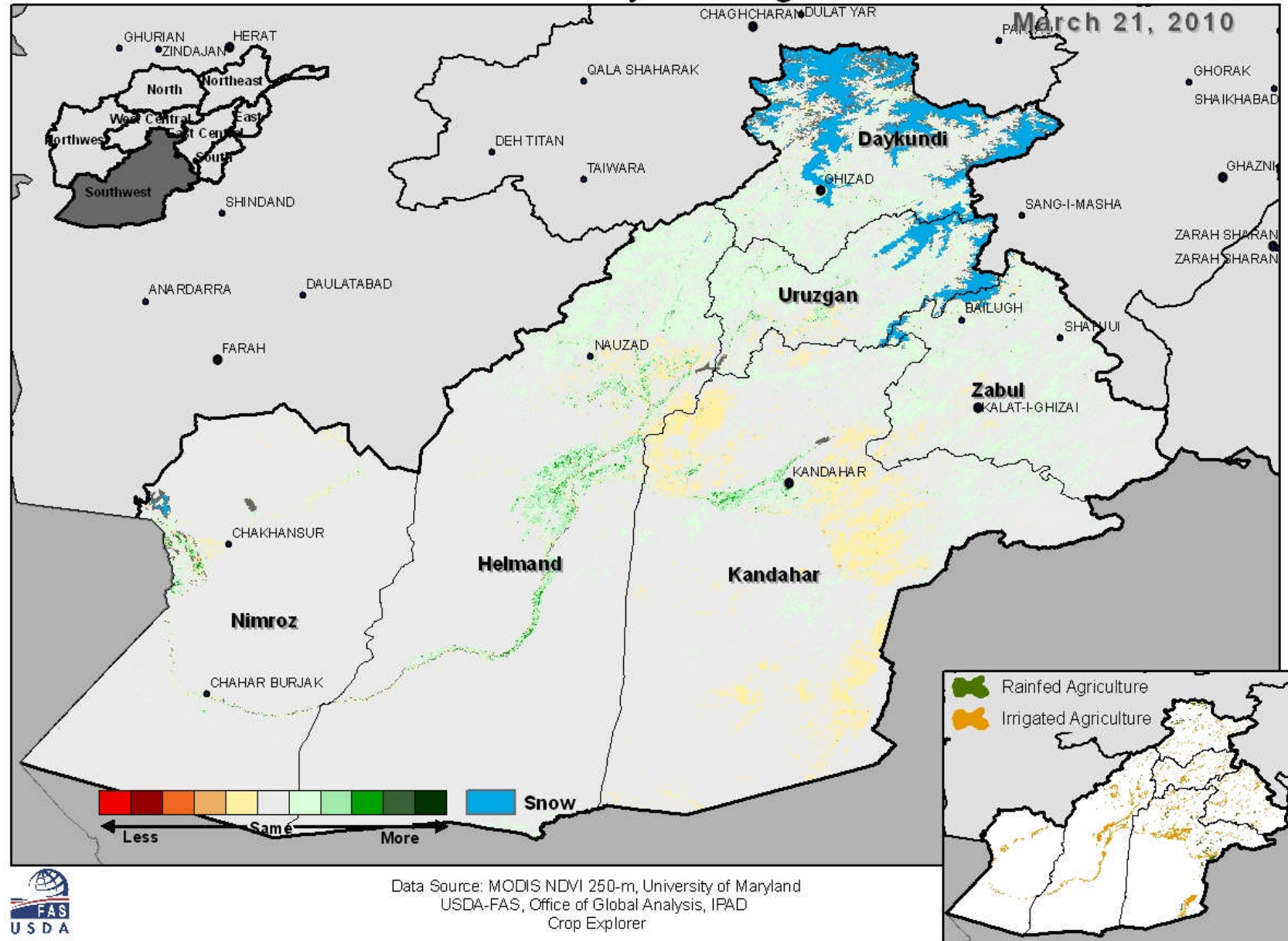
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Figure 22. MODIS NDVI comparing current conditions against previous season (MY 2009/10), South Provinces

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MODIS NDVI Difference from 6yr Average: Southwest Provinces



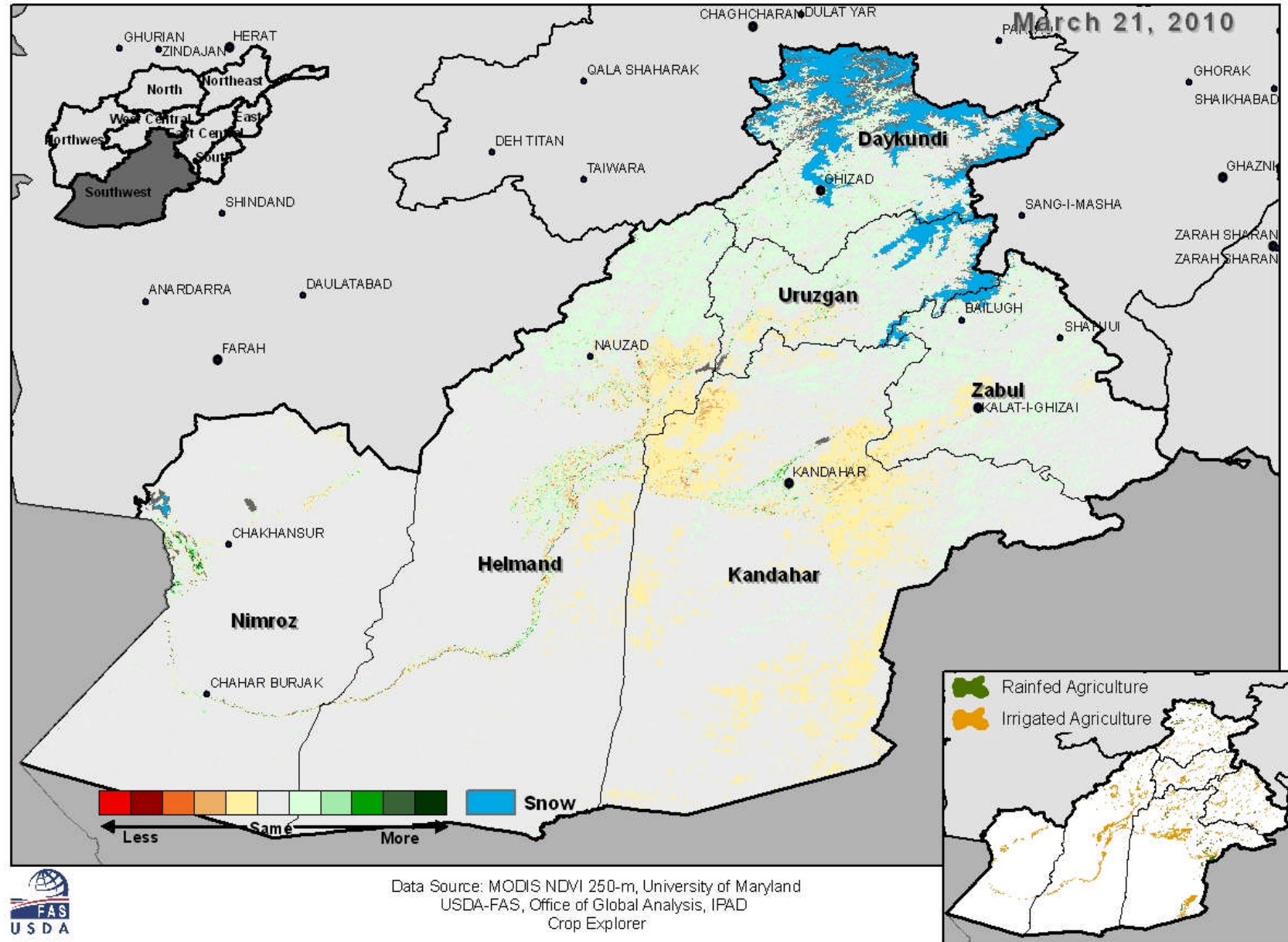
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Figure 23. MODIS NDVI comparing current conditions against previous 6-year average, Southwest Provinces

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MODIS NDVI Difference from Last Year: Southwest Provinces



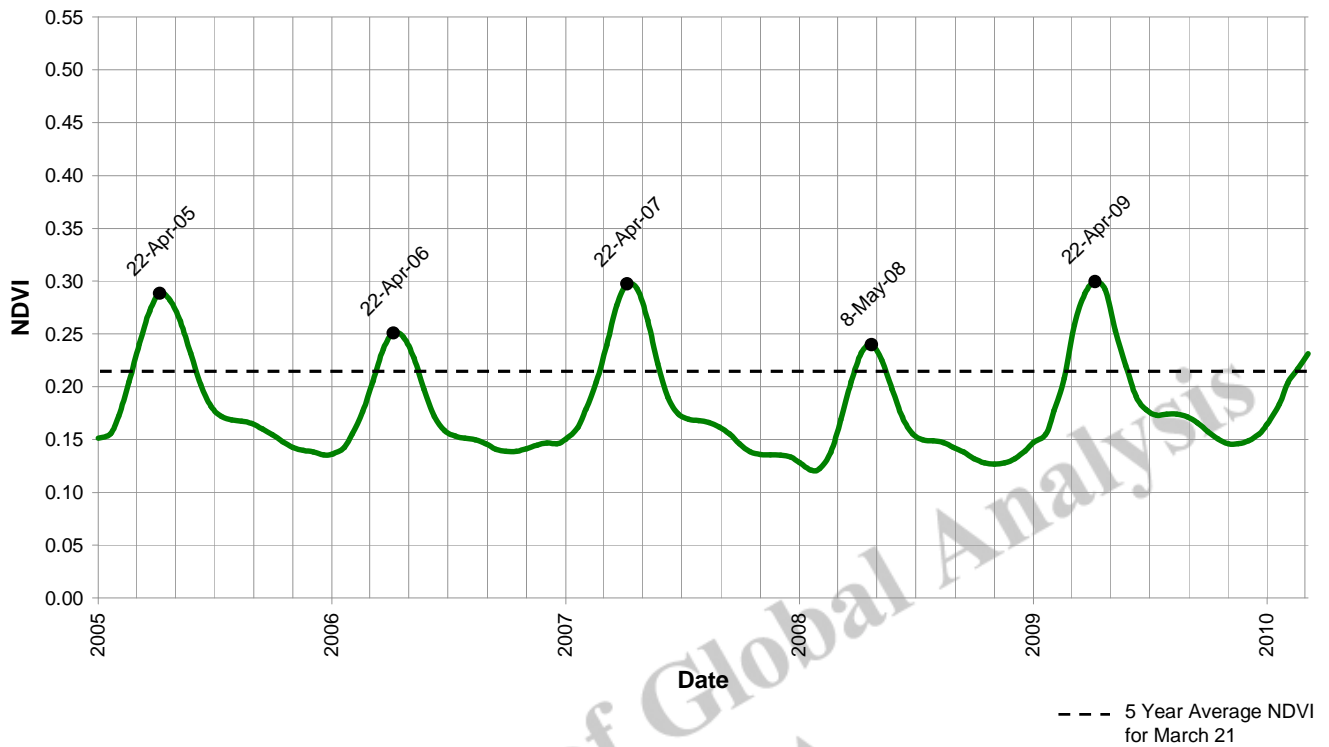
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Figure 24. MODIS NDVI comparing current conditions against previous season (MY 2009/10), Southwest Provinces

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NDVI Time Series: Northwest Region, Irrigated



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NDVI Time Series: Northwest Region, Rainfed

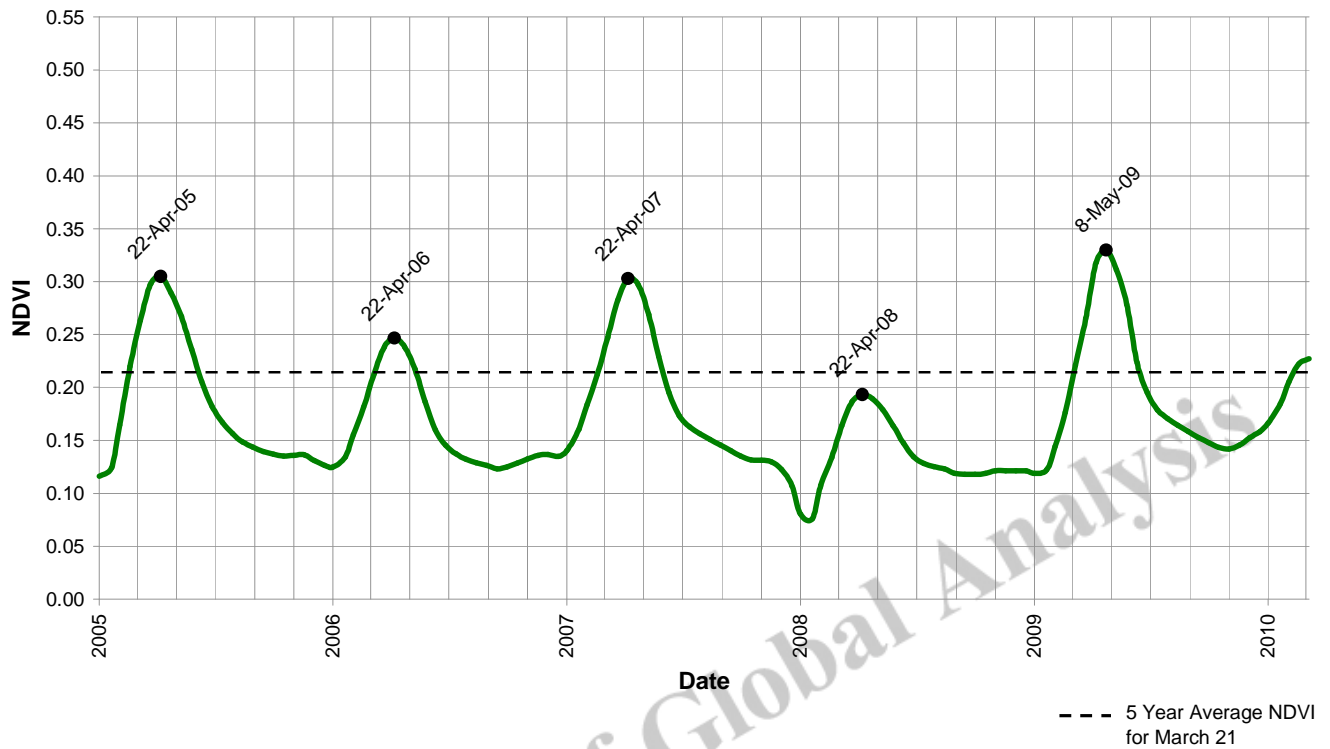
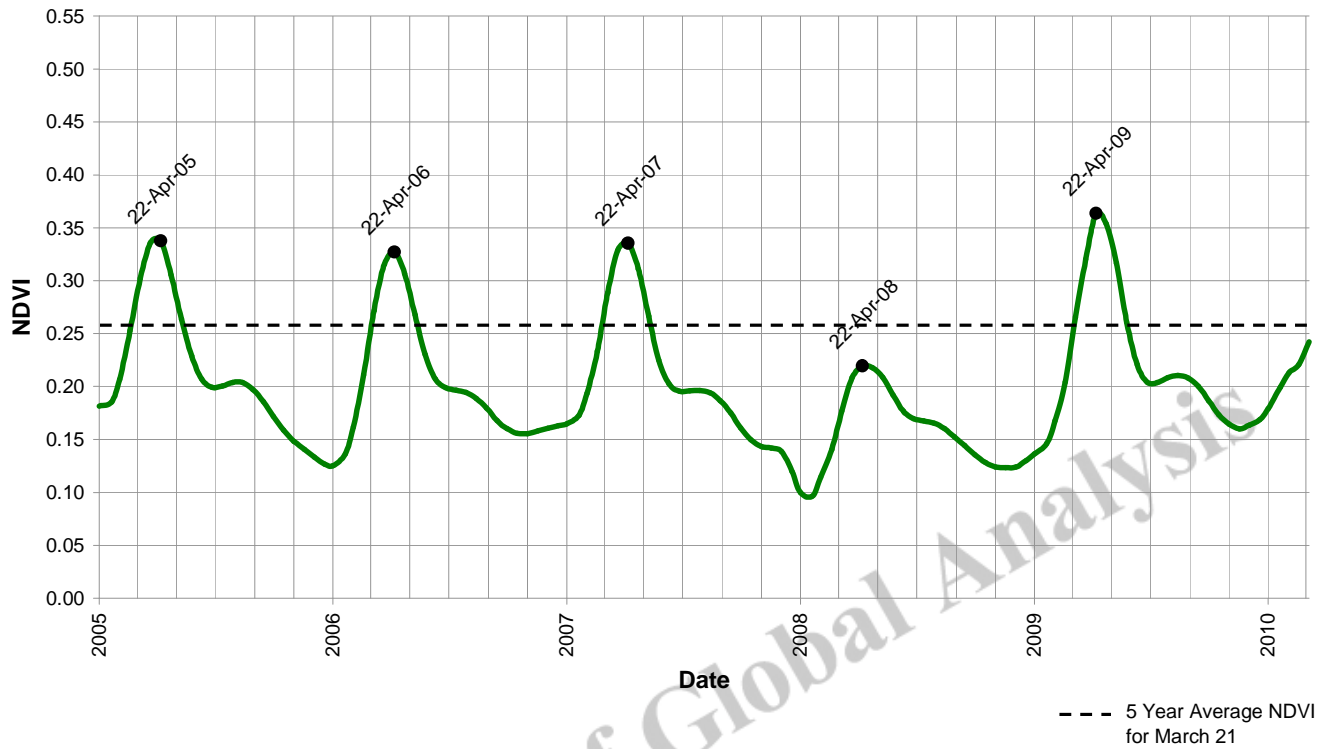


Figure 25. MODIS NDVI time series profiles Northwest Region, January 1, 2005 through March 21, 2010

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NDVI Time Series: North Region, Irrigated



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NDVI Time Series: North Region, Rainfed

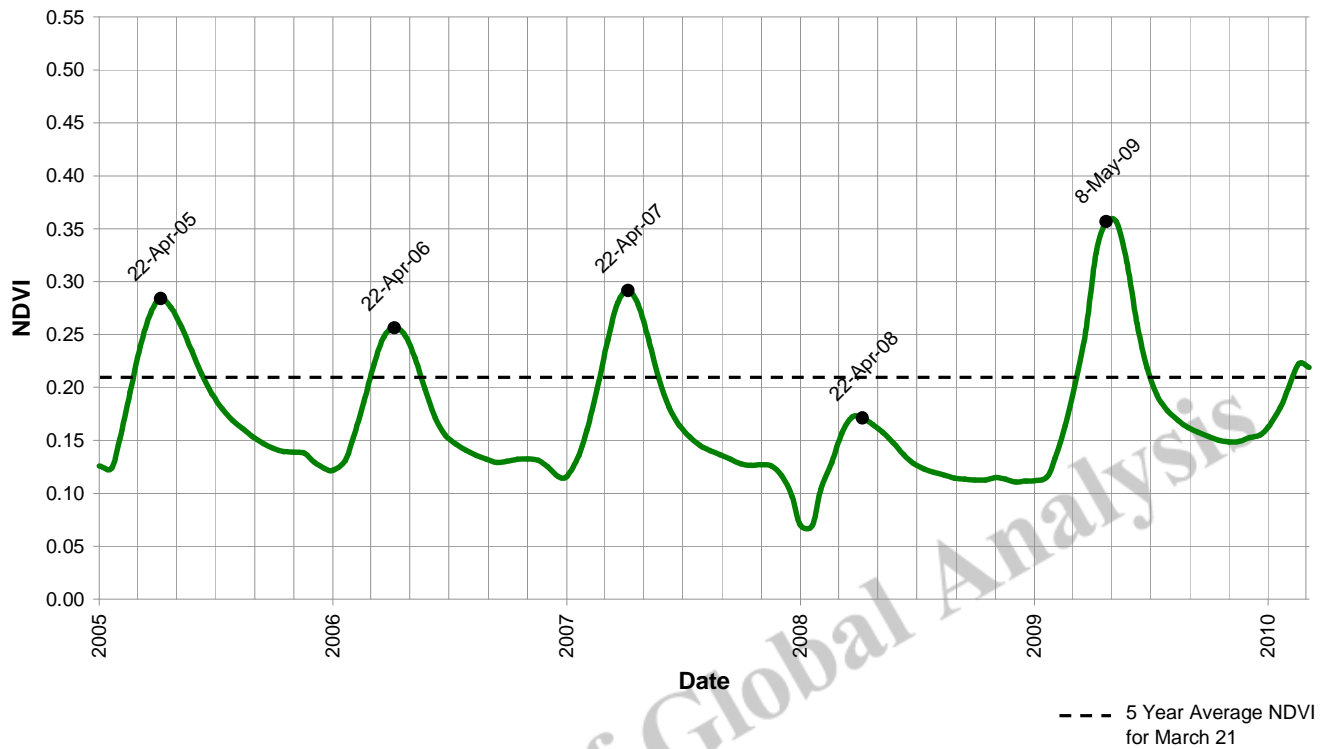
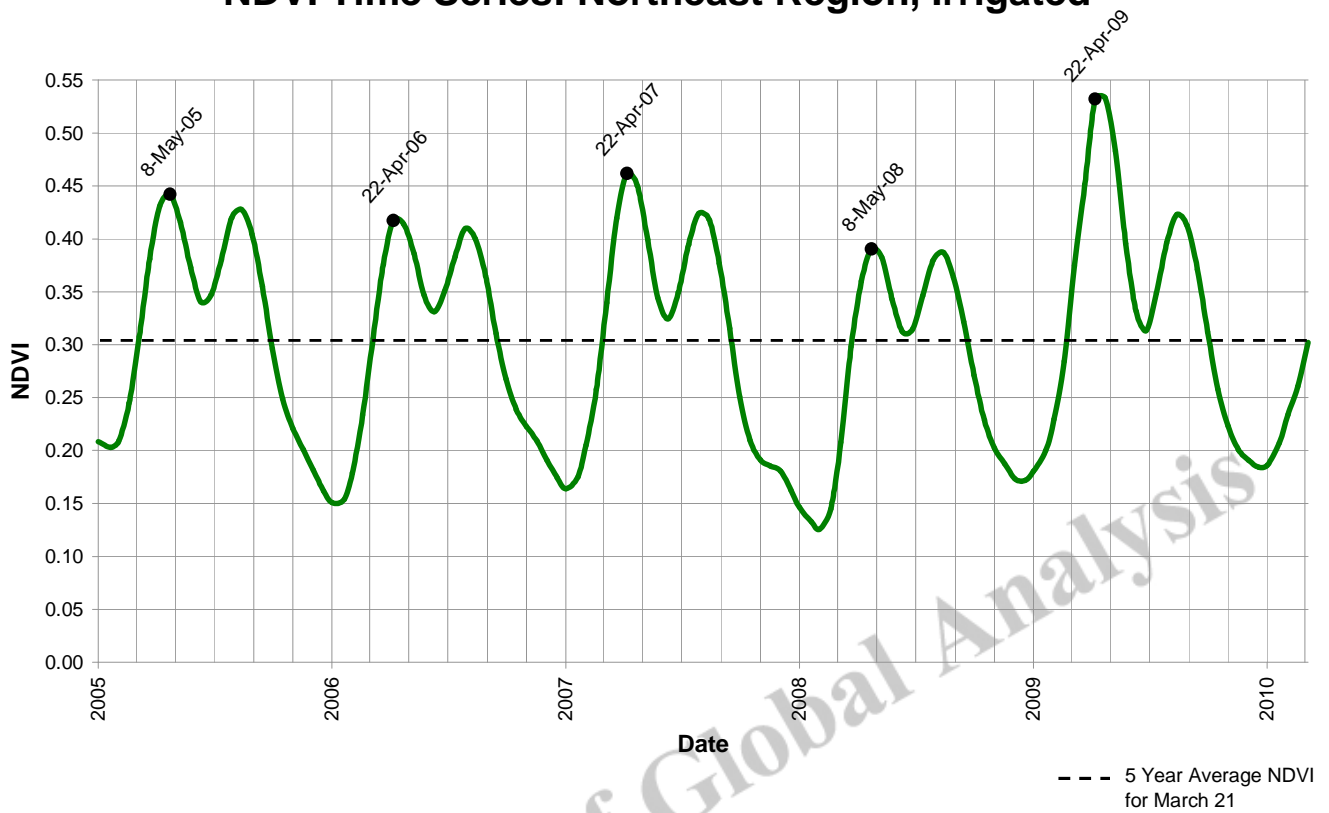


Figure 26. MODIS NDVI time series profiles North Region, January 1, 2005 through March 21, 2010

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NDVI Time Series: Northeast Region, Irrigated



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NDVI Time Series: Northeast Region, Rainfed

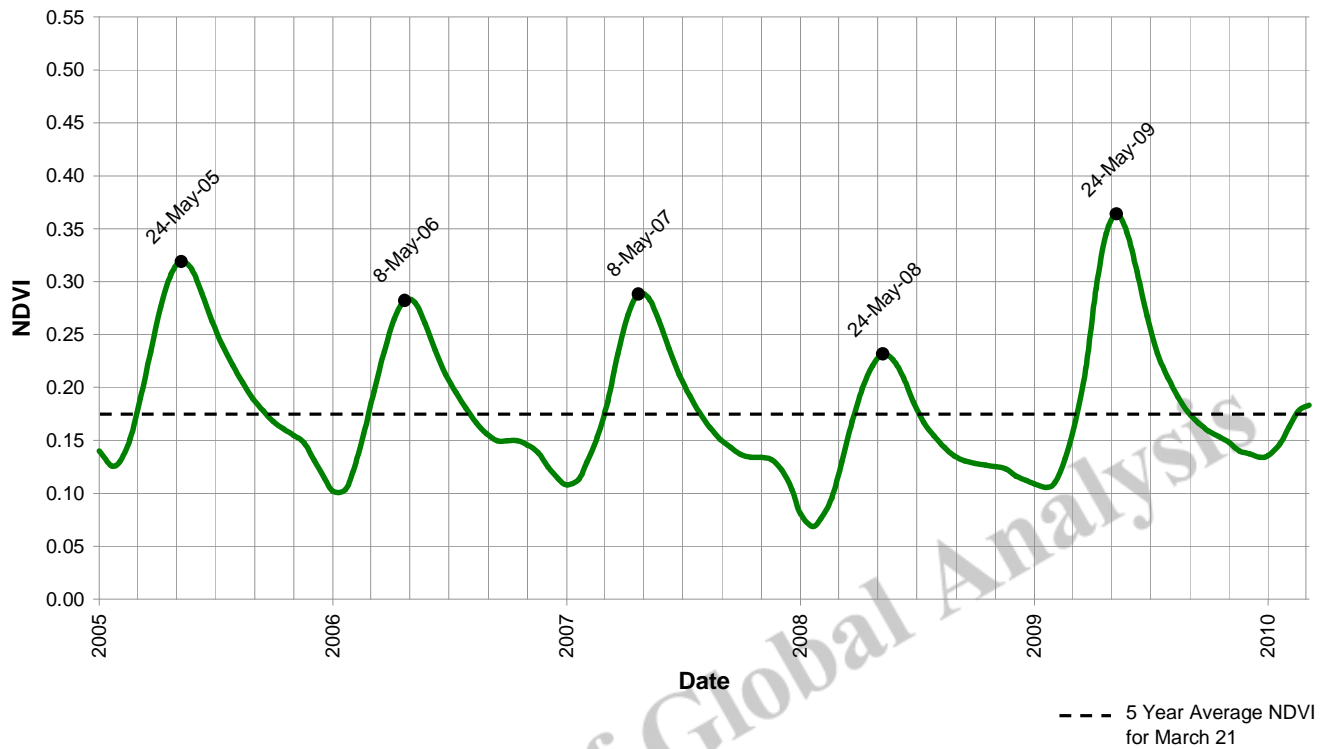


Figure 27. MODIS NDVI time series profiles Northeast Region, January 1, 2005 through March 21, 2010

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NDVI Time Series: East Region, Irrigated

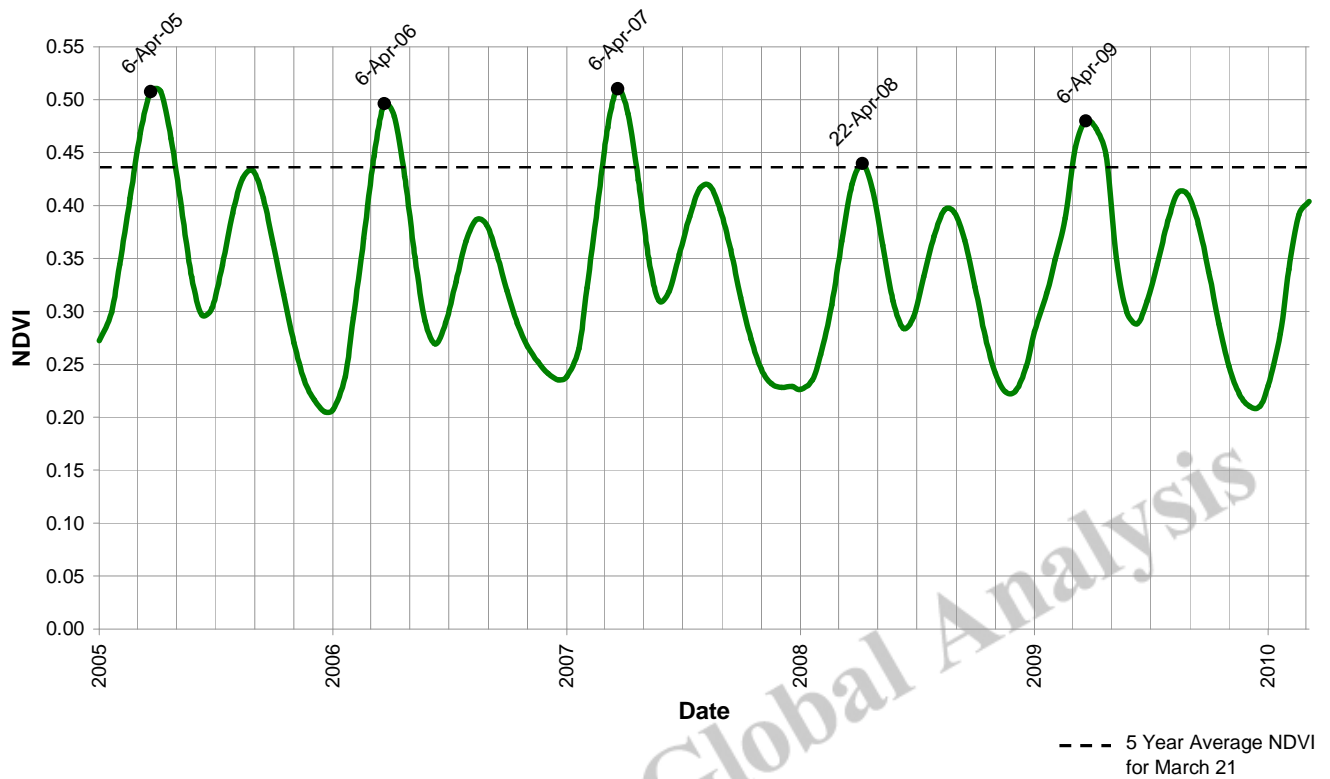


Figure 28. MODIS NDVI time series profile East Region, January 1, 2005 through March 21, 2010

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NDVI Time Series: East Central Region, Irrigated

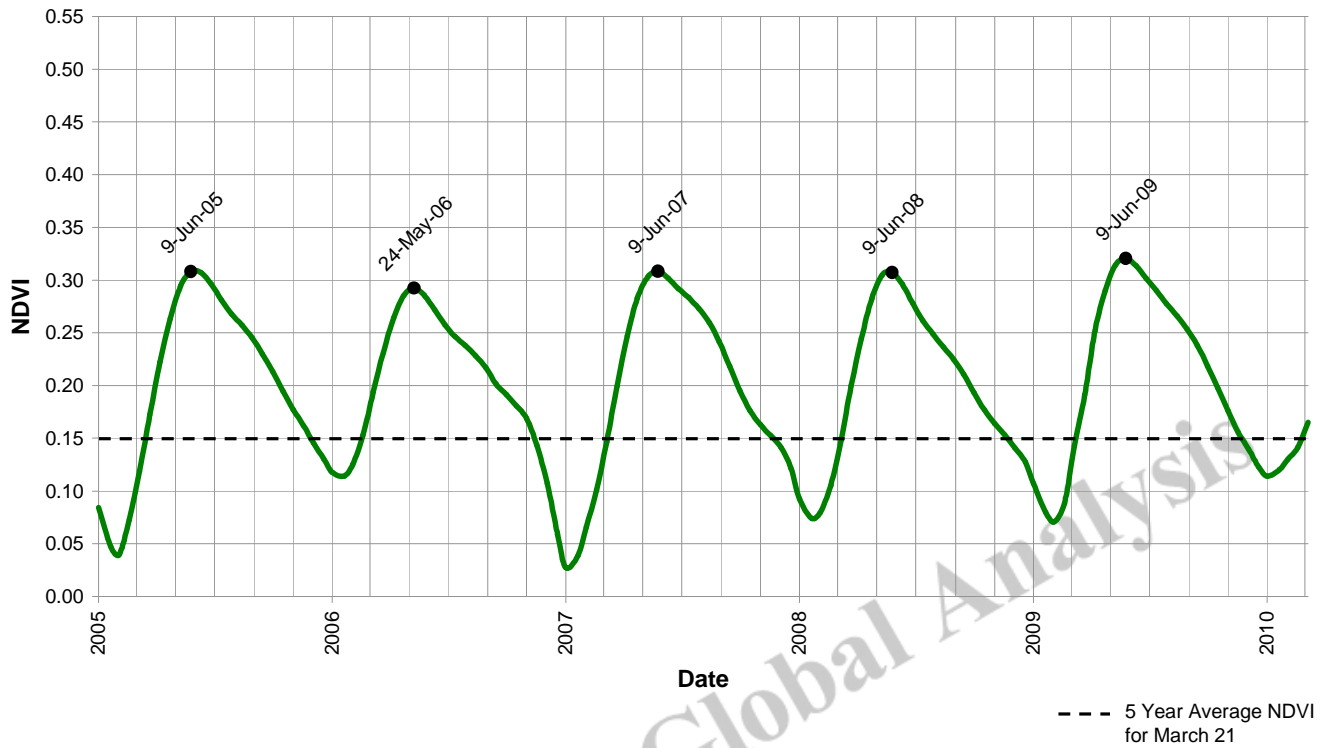


Figure 29. MODIS NDVI time series profile East Central Region, January 1, 2005 through March 21, 2010

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 International Operational Agriculture Monitoring Program
NDVI Time Series: West Central Region, Irrigated

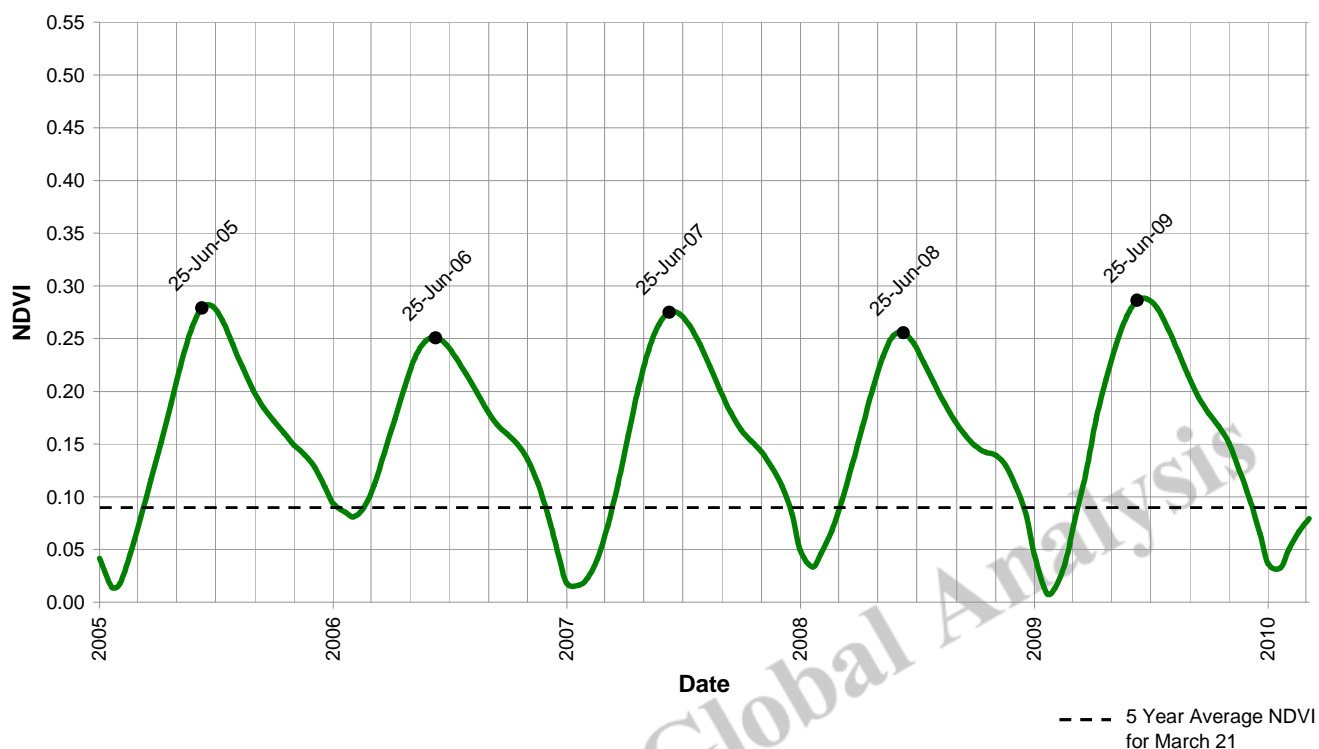
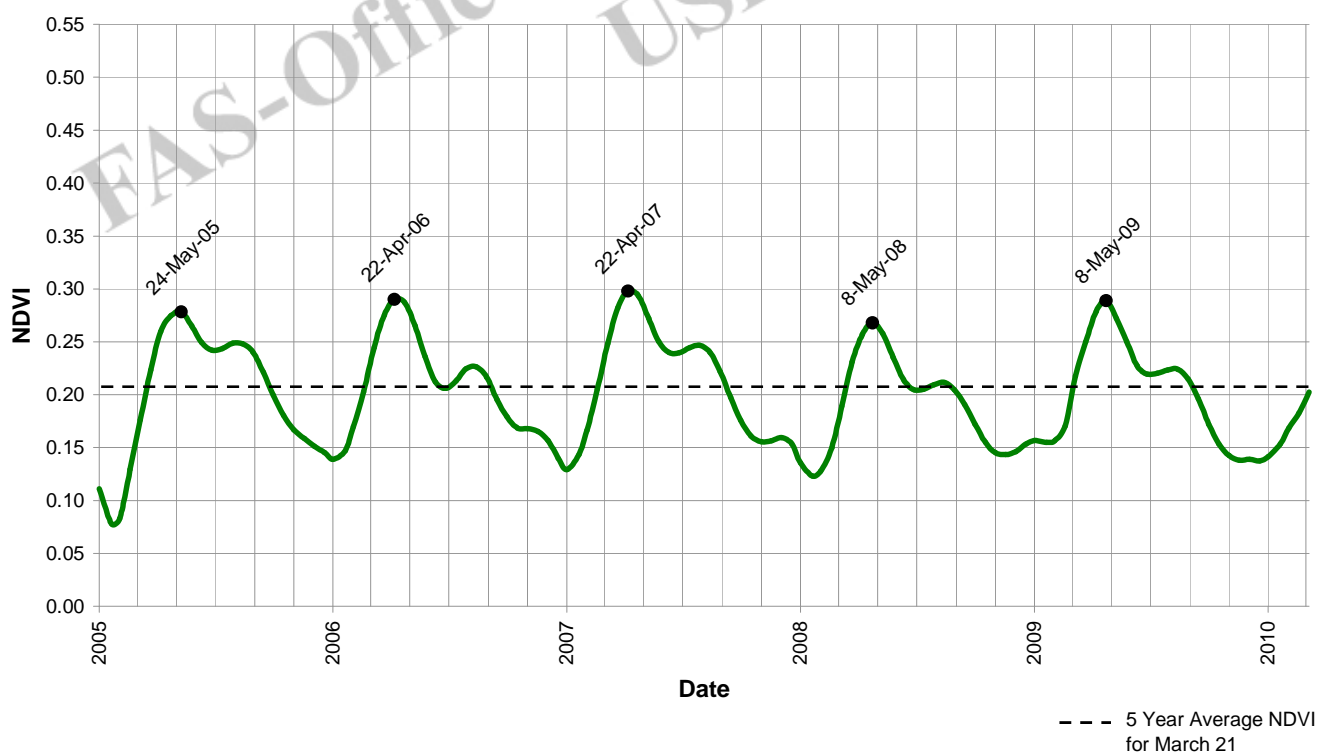


Figure 30. MODIS NDVI time series profile West Central Region, January 1, 2005 through March 21, 2010

NDVI Time Series: South Region, Irrigated



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Figure 31. MODIS NDVI times series profile South Region, January 1, 2005 through March 21, 2010

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NDVI Time Series: Southwest Region, Irrigated

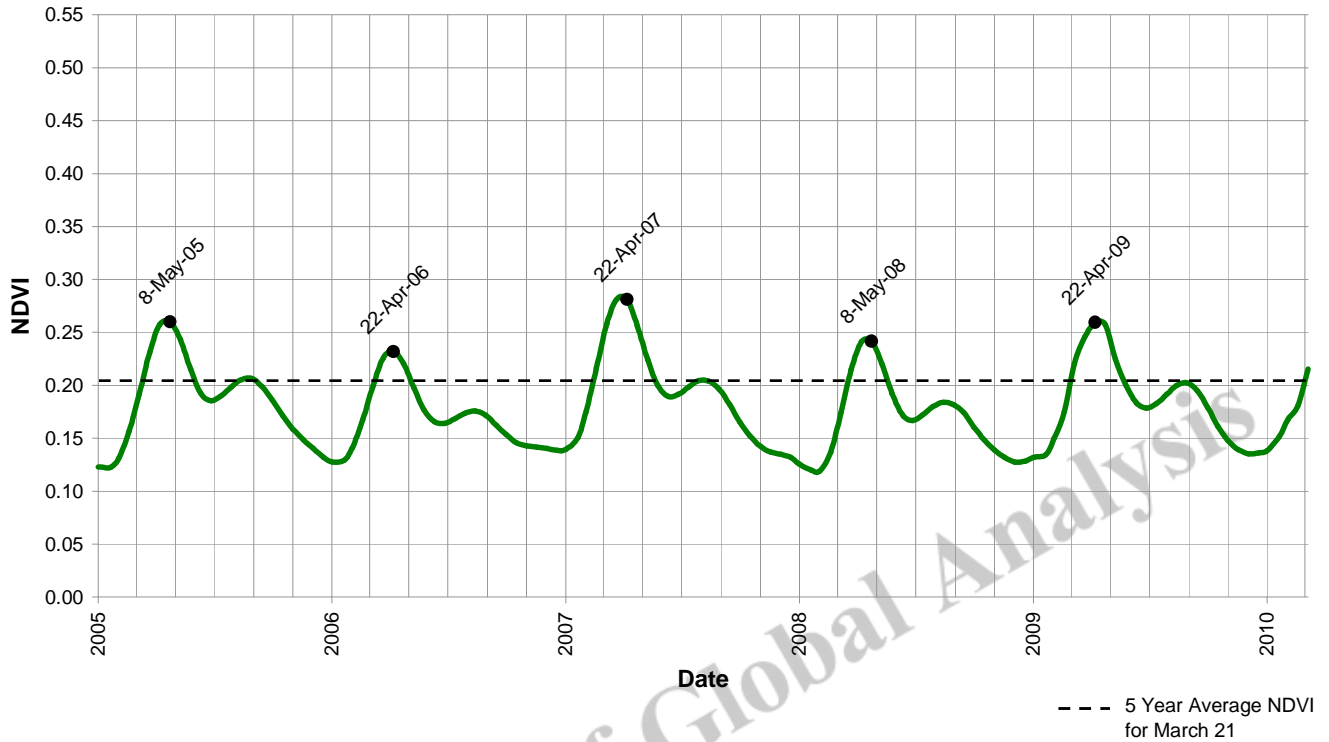
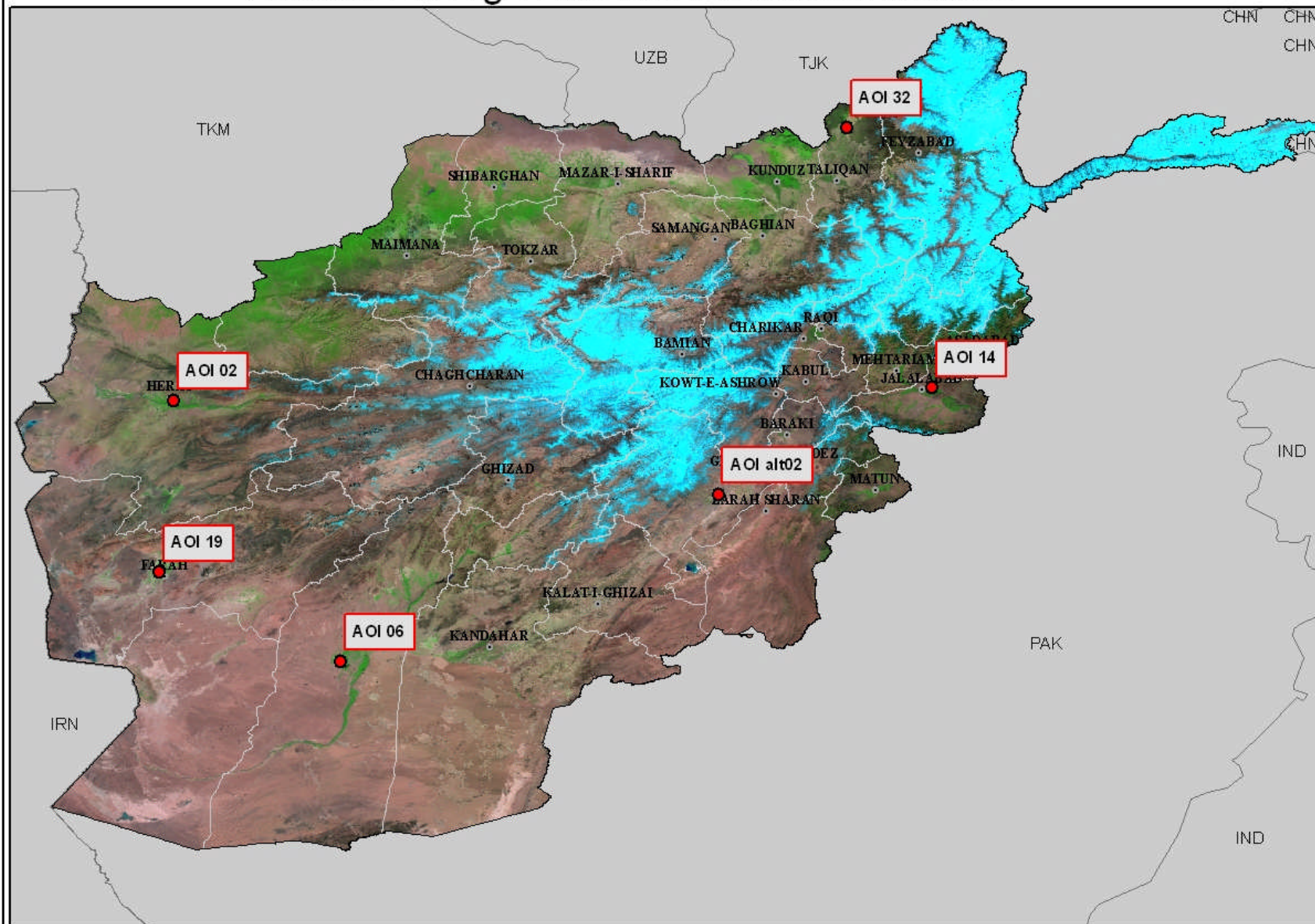


Figure 32. MODIS NDVI time series profile Southwest Region, January 1, 2005 through March 21, 2010

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Location of High Resolution Areas of Interest



Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

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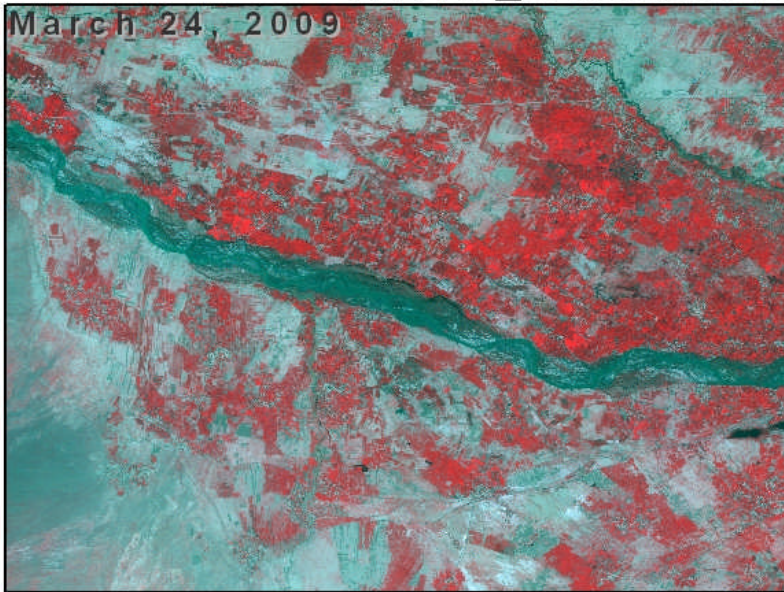
Figure 33. Location of Quickbird AOIs acquired over grains producing areas in March.

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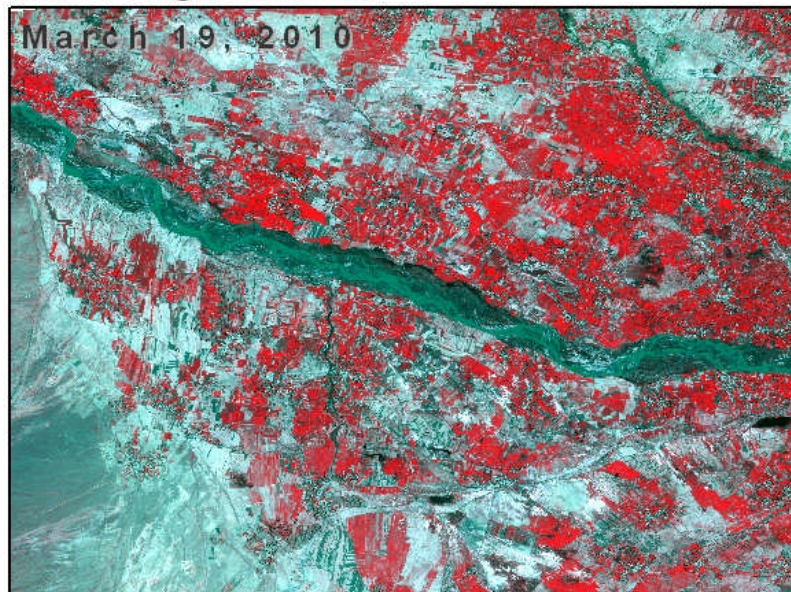
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AOI AF_02: Herat Province, Afghanistan

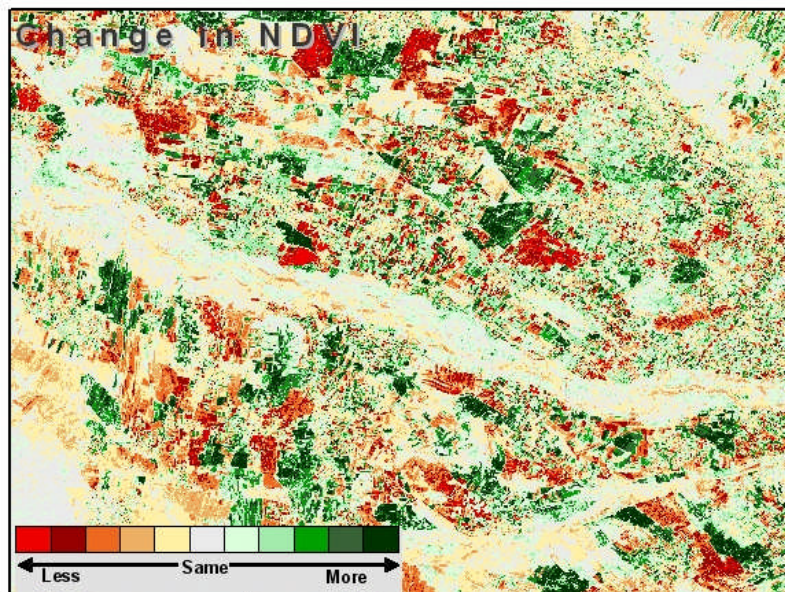
March 24, 2009



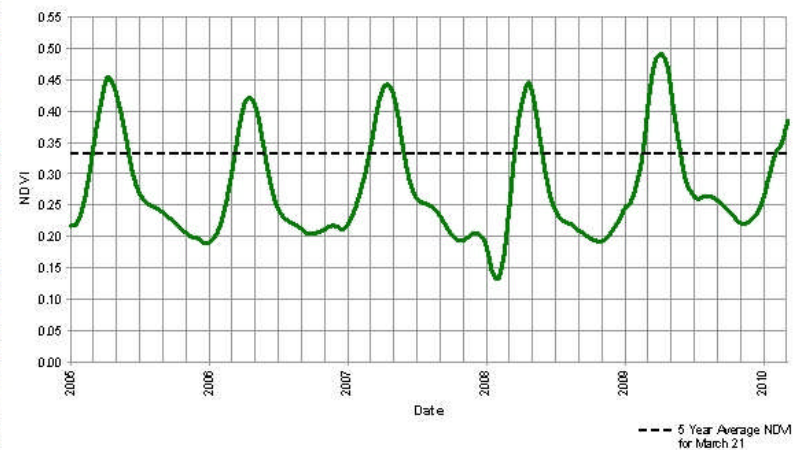
March 19, 2010



Change in NDVI



NDVI Time Series: AOI AF_02



Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD

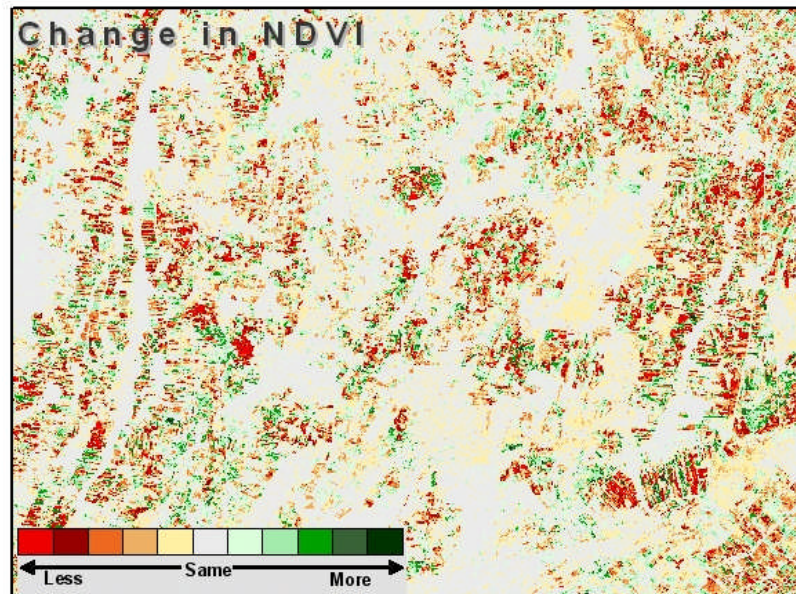
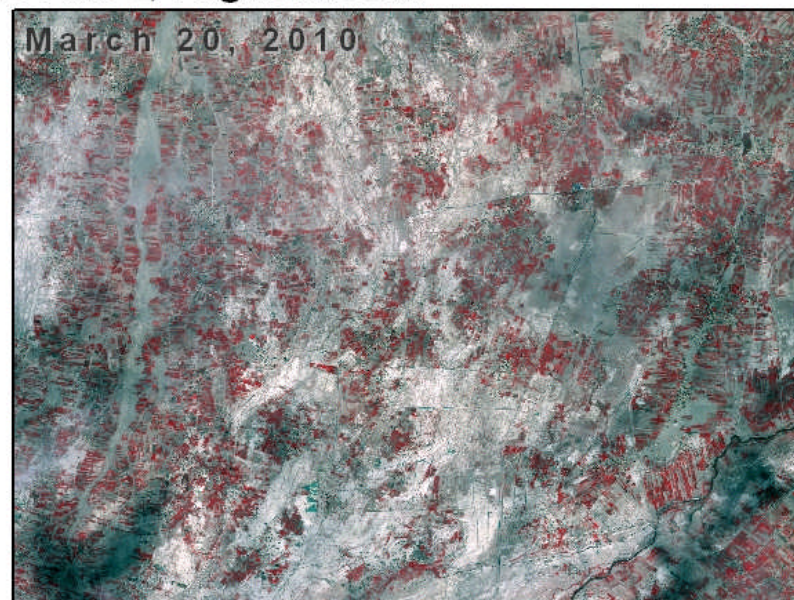
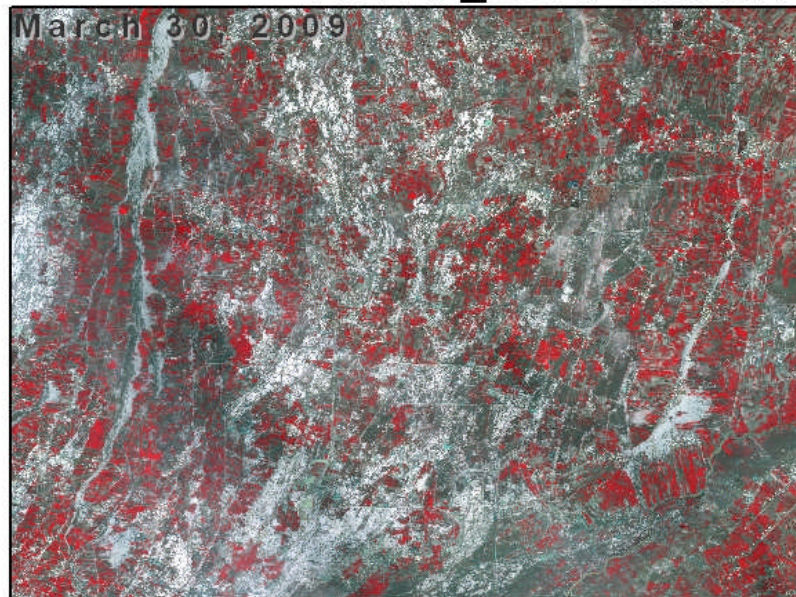
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Figure 34. High resolution imagery in Herat, Afghanistan. Quickbird imagery comparing current year vs. previous season show significant loss and gain of NDVI as a result of crop rotation patterns, fields left fallow in alternate years. NDVI time series shows MY 2010/11 with less overall vegetation than last year but greater than average.

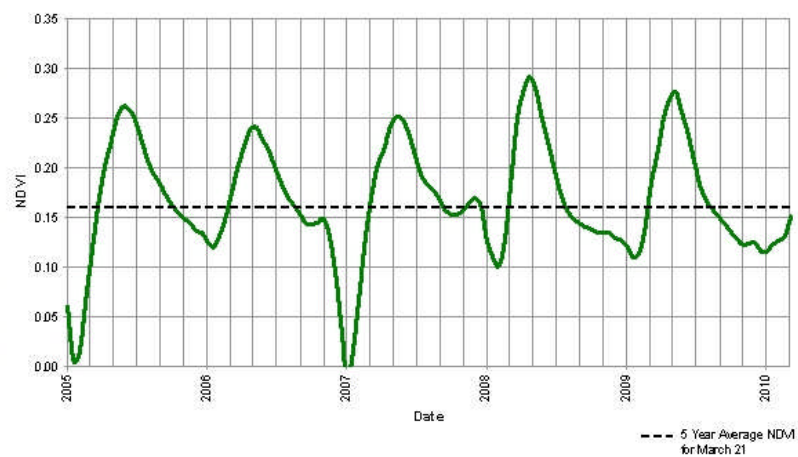
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AOI AF_alt02: Ghazni Province, Afghanistan



NDVI Time Series: AOI AF_alt02



Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD

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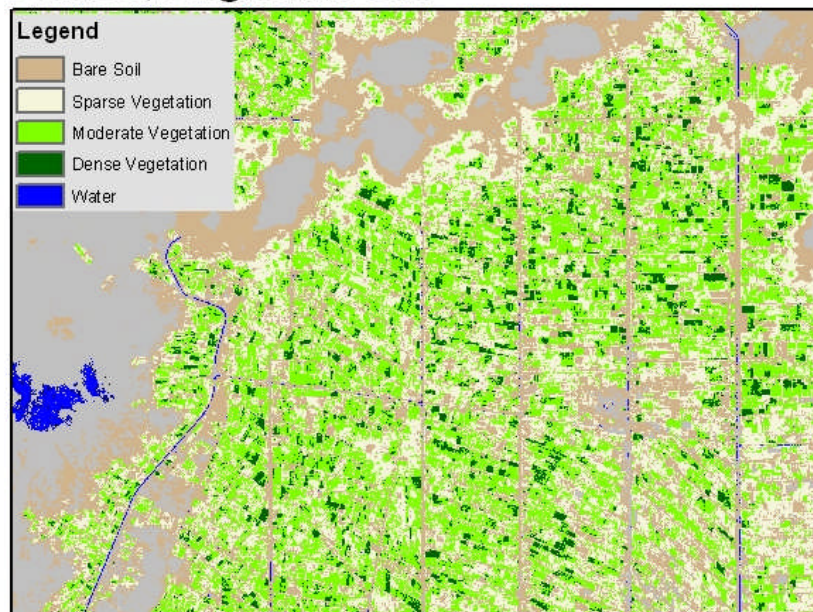
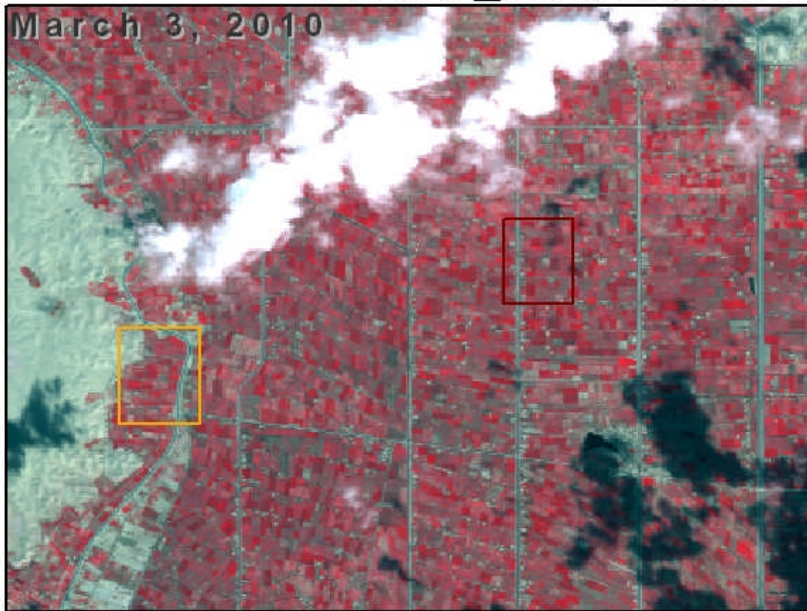
Figure 35. High resolution imagery in Ghazni, Afghanistan. Quickbird imagery comparing current year vs. previous season shows both loss and gain of NDVI as a result of crop rotation patterns.

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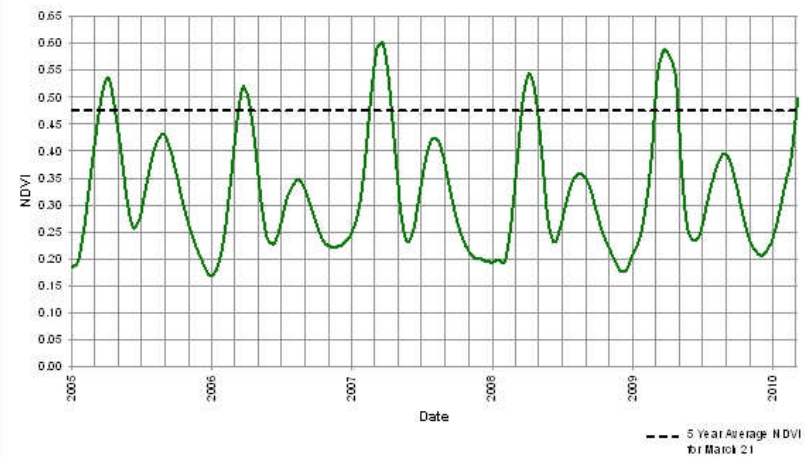
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AOI AF_06: Helmand Province, Afghanistan

March 3, 2010



NDVI Time Series: AOI AF_06



Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD

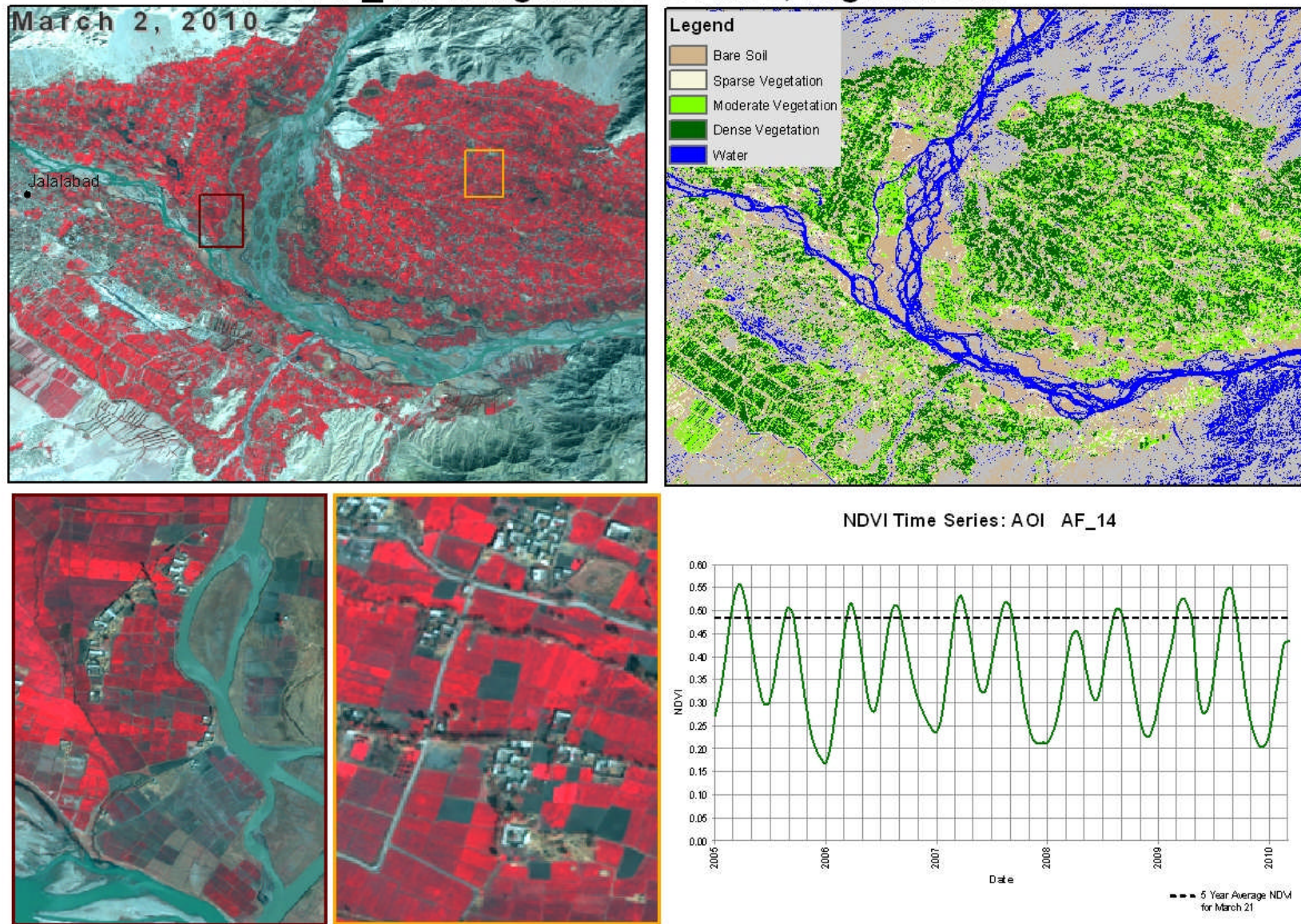
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Figure 36. High resolution imagery in Helmand, Afghanistan.

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AOI AF_14: Nangarhar Province, Afghanistan



Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD

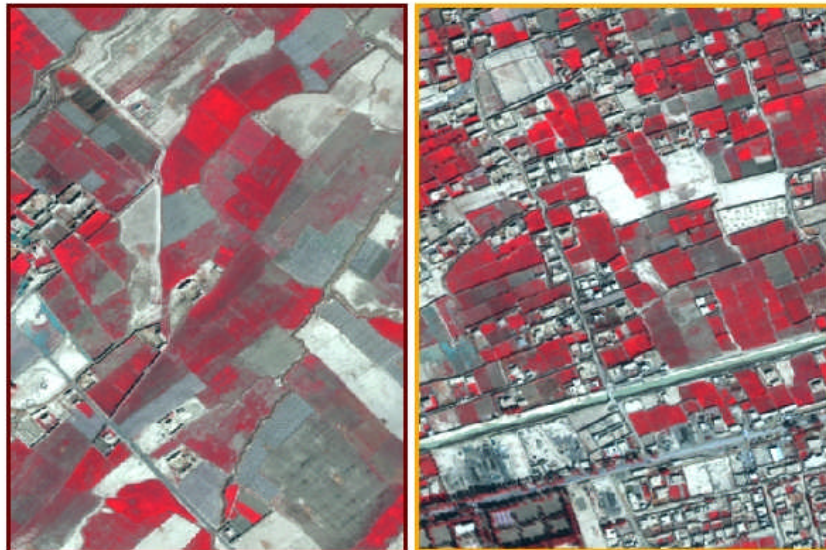
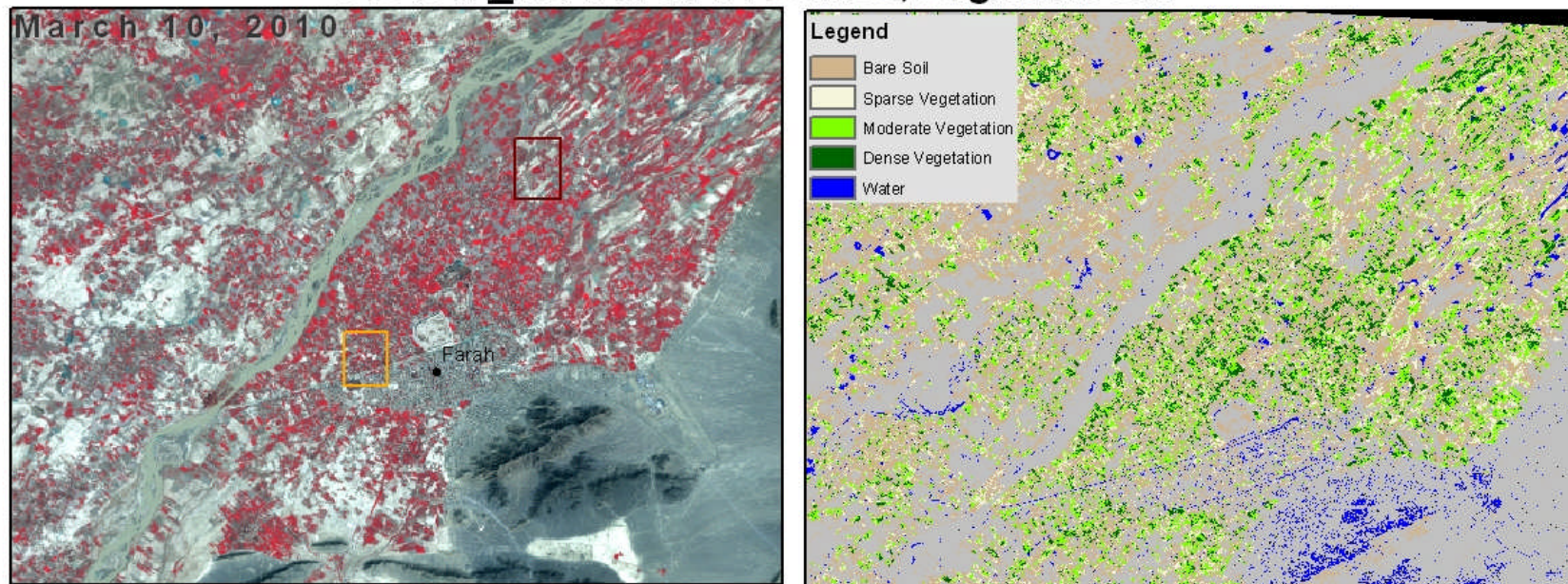
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Figure 37. High resolution imagery in Nangarhar, Afghanistan. Spring snow melt flowing down through the river channels is evident though irrigated crop vigor is currently lower than normal.

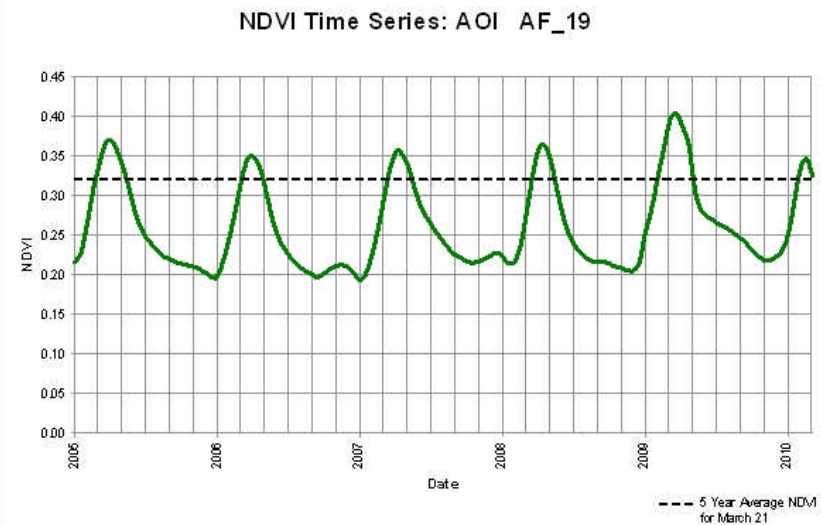
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AOI AF_19: Farah Province, Afghanistan



Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD



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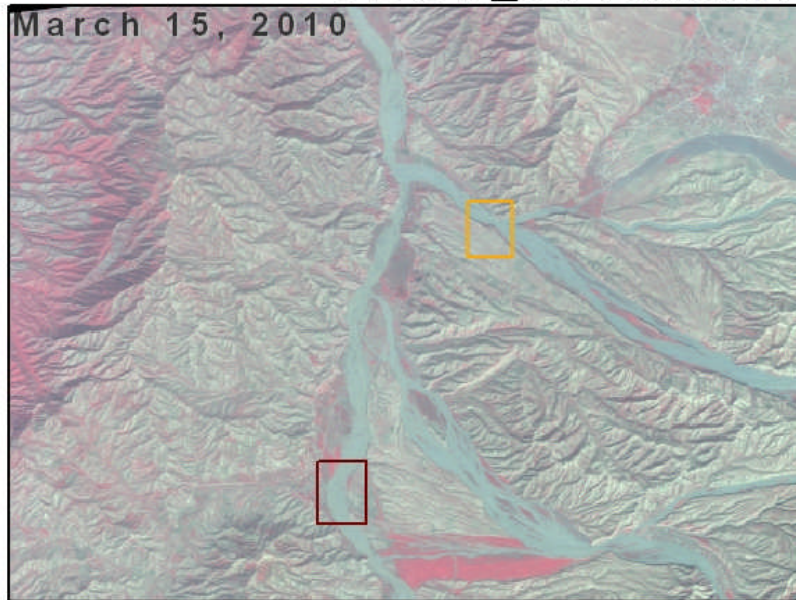
Figure 38. High resolution imagery in Farah, Afghanistan. Ample irrigation supplies through flowing surface water is evident.

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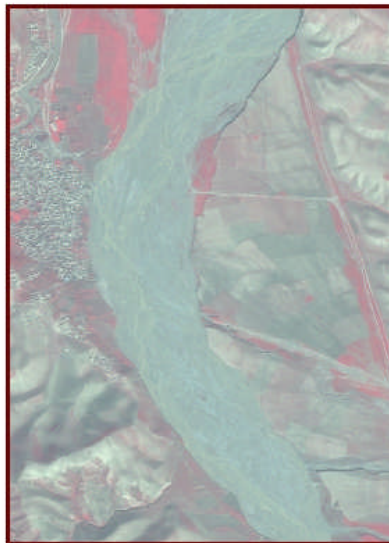
AOI AF_32: Takhar Province, Afghanistan

March 15, 2010

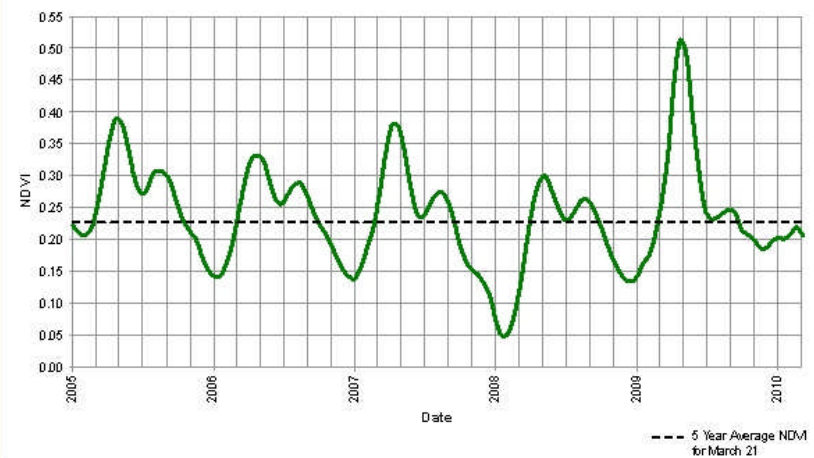


Legend

- Bare Soil
- Sparse Vegetation
- Moderate Vegetation
- Dense Vegetation
- Water



NDVI Time Series: AOI AF_32



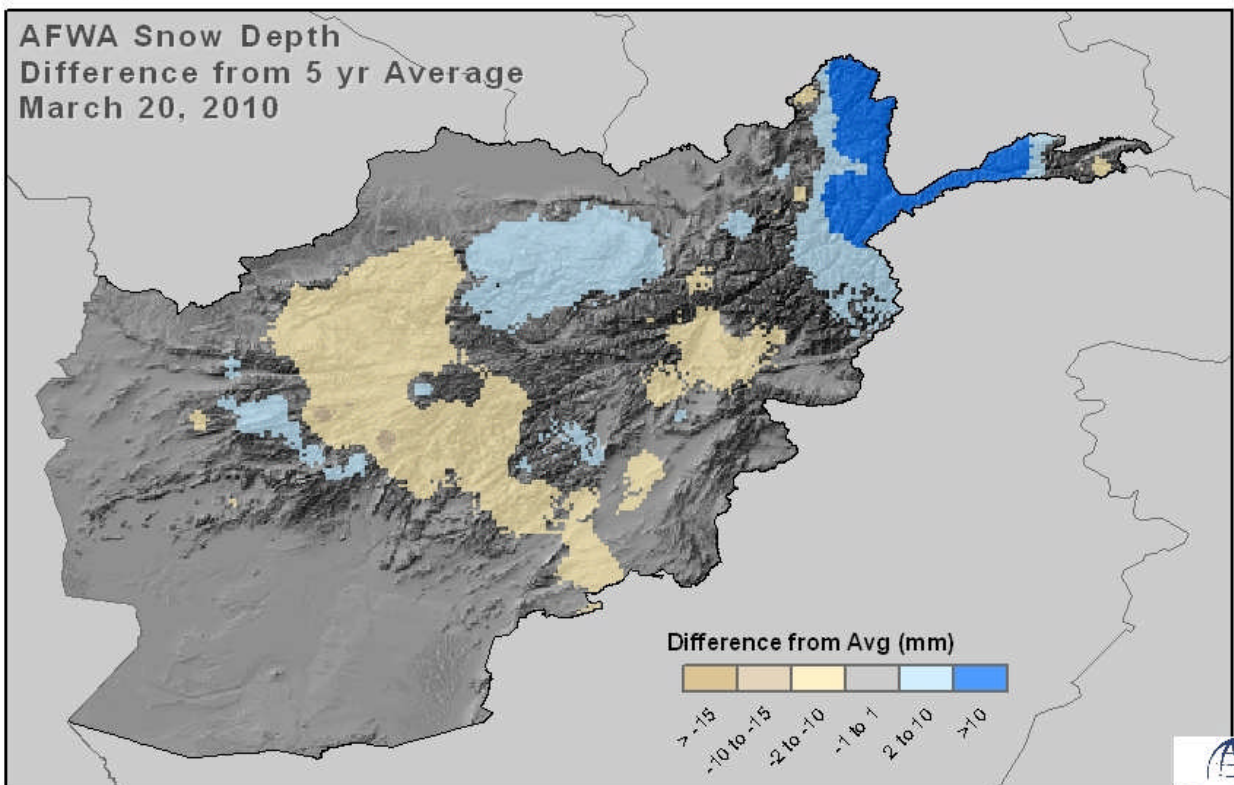
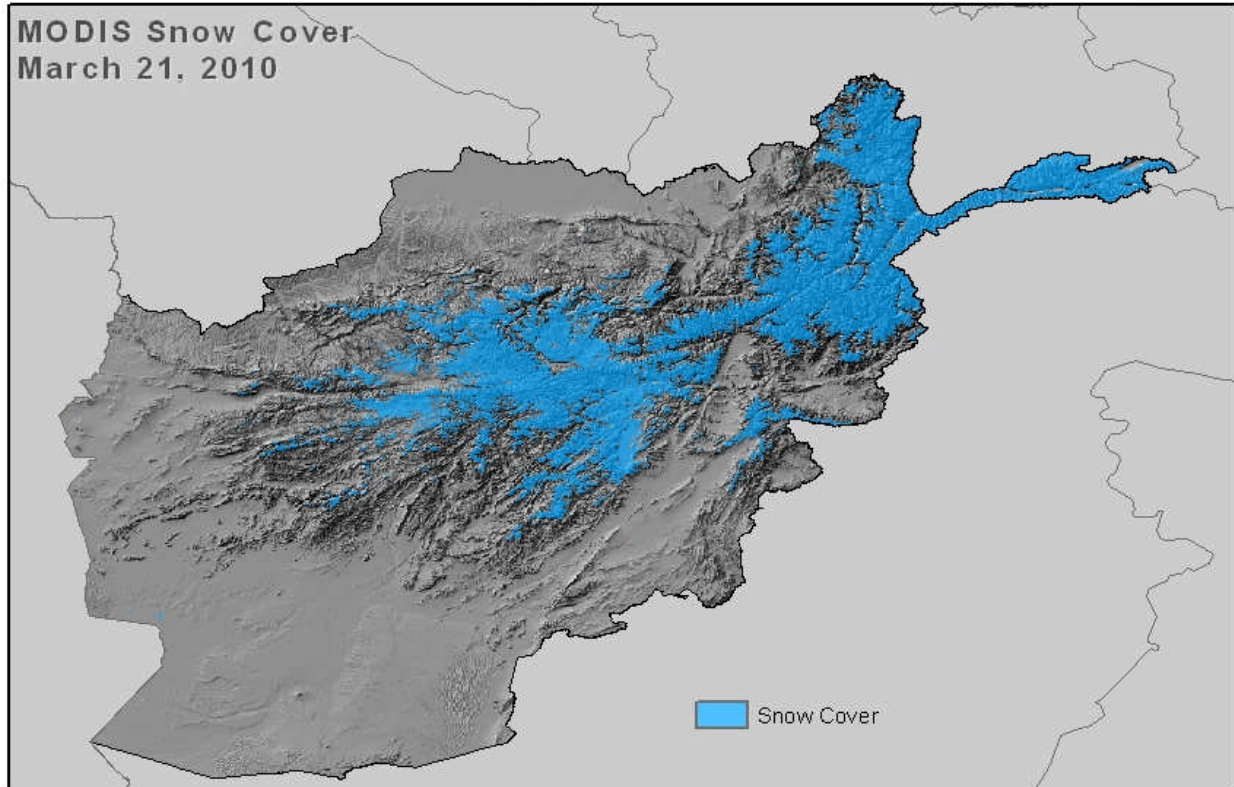
Data Source: Quickbird MS
Data Provider: NGA, Digital Globe
USDA-FAS, Office of Global Analysis, IPAD

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Figure 39. High resolution imagery in Takhar, Afghanistan. Crop fields with very sparse vegetation are evident however the Northeast region remains at relatively cold temperatures through March not idea for early spring crop growth. Typical grain production in this region is spring planted wheat varieties.

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Snow Cover and Depth Difference from Average



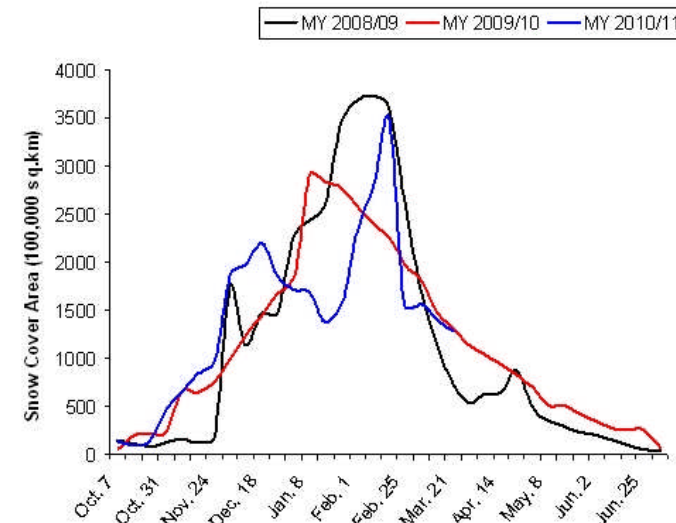
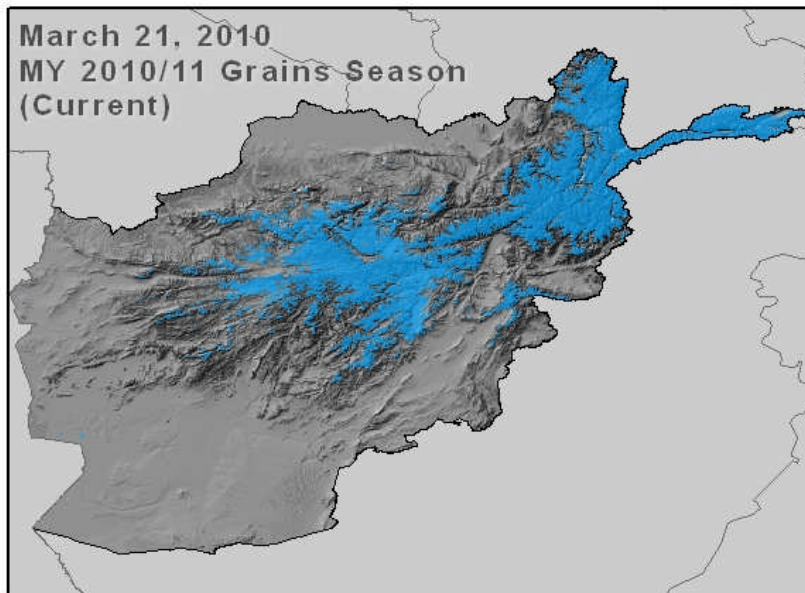
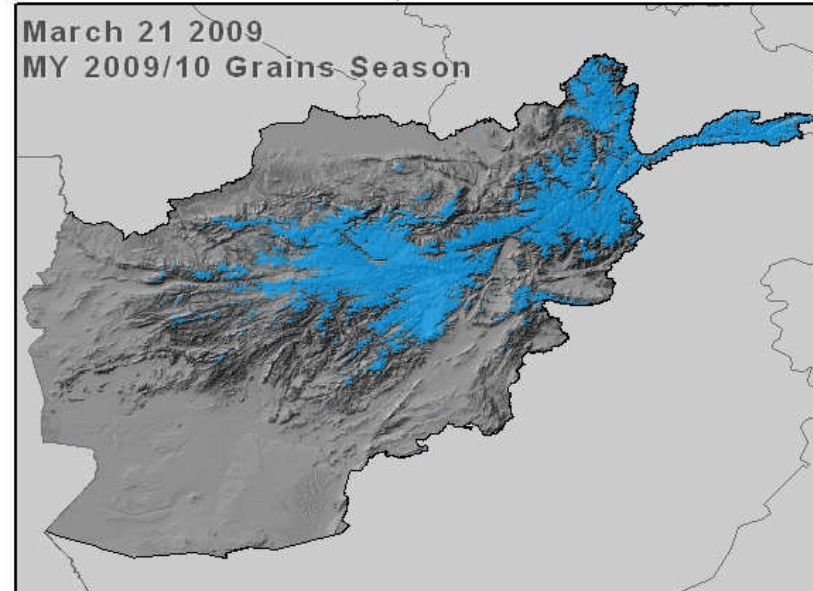
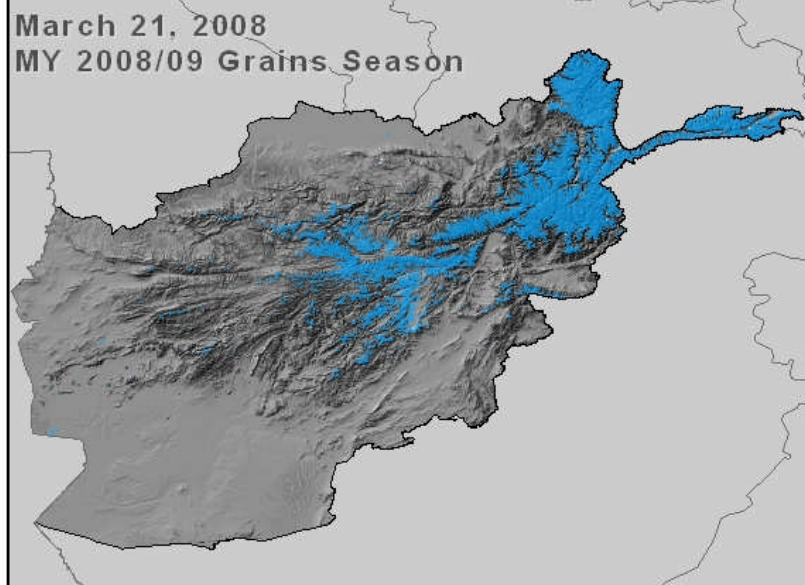
Data Source: MODIS Snow Cover; AFWA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD

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Figure 40. MODIS snow cover and AFWA snow depth difference from 5 year average.

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MODIS Snow Cover: Comparison March 2008, 2009 and 2010



Data Source: MODIS Snow Cover
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD



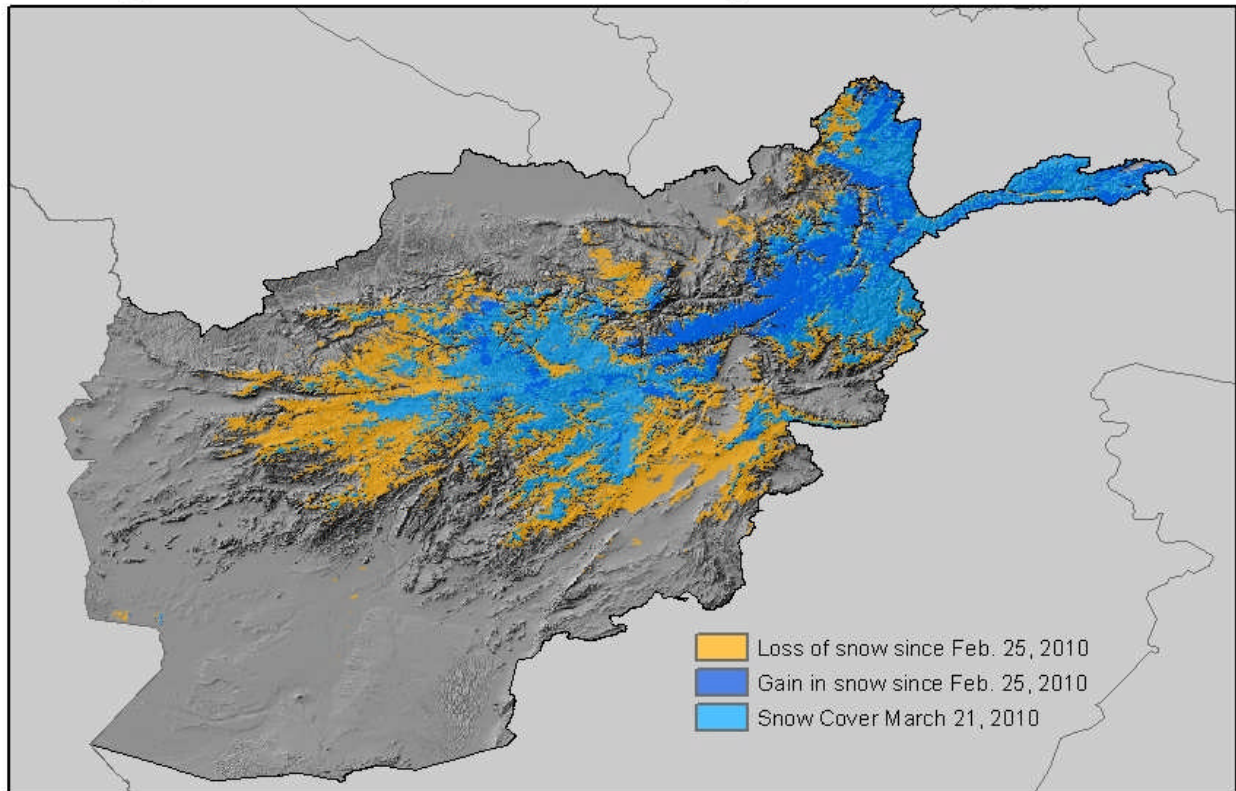
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Figure 41. Comparison of MODIS snow cover area between current season (MY 2010/11), last year (MY 2009/10) and the 2008 crop drought year (MY 2008/09)

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Change in Snow Area: February 2010 to March 2010



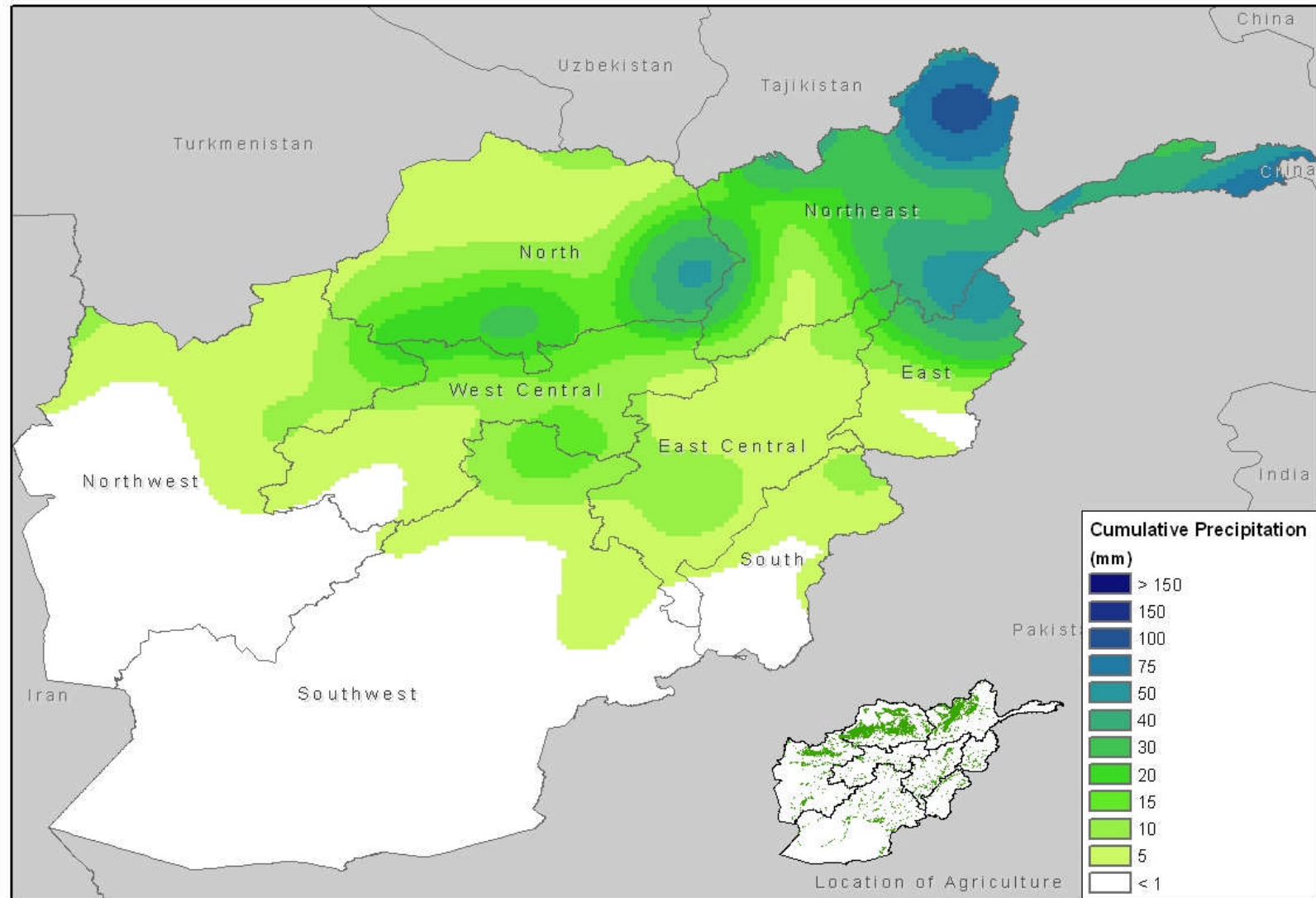
Data Source: MODIS Snow Cover; AFWA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD



Figure 42. MODIS snow cover showing gains and losses of winter snow pack over the past month February 25 to March 21, 2010.

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7-Day Precipitation Outlook: March 29 - April 5, 2010



Data Source: NOAA Global Forecast System (GFS)
Data Provided by: NOAA CPC
Supporting: USDA/FAS/OGA/IPAD



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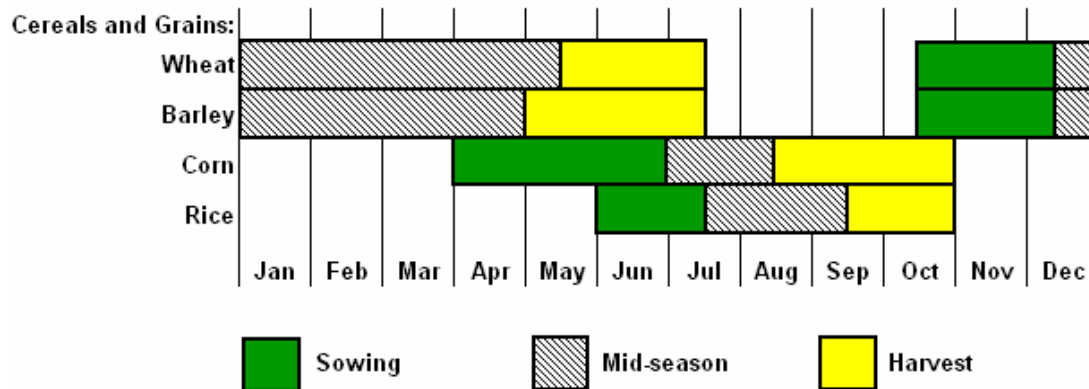
Figure 43. NOAA Climate Prediction Center 7-day precipitation forecast.

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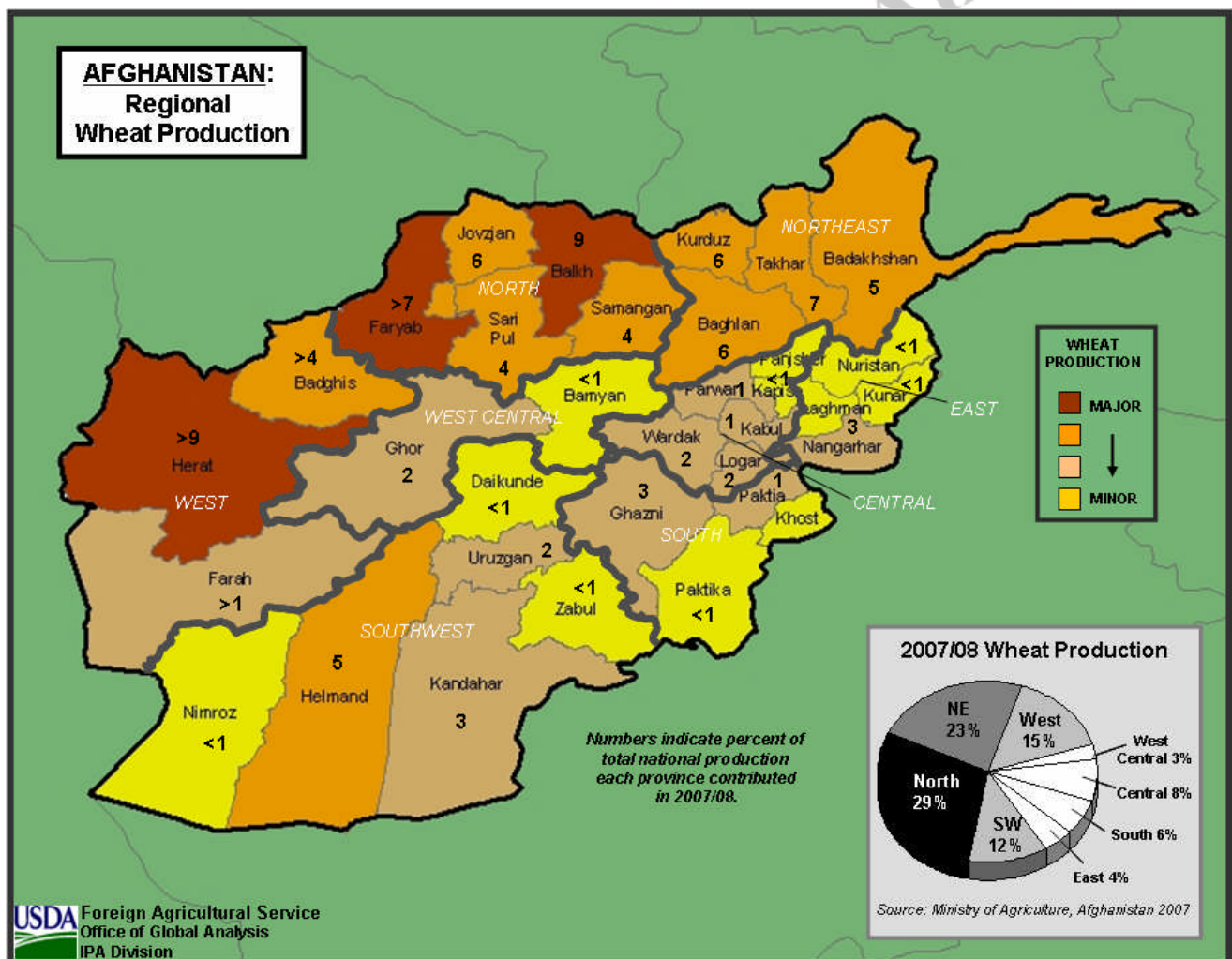
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APPENDIX

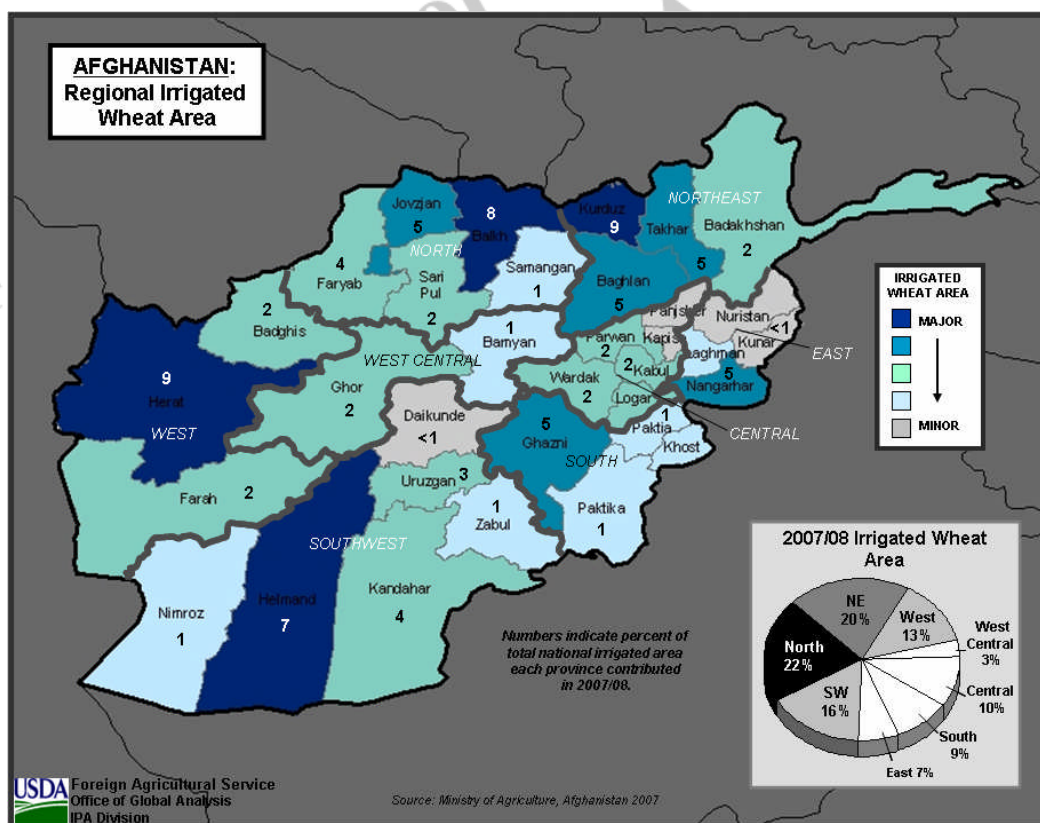
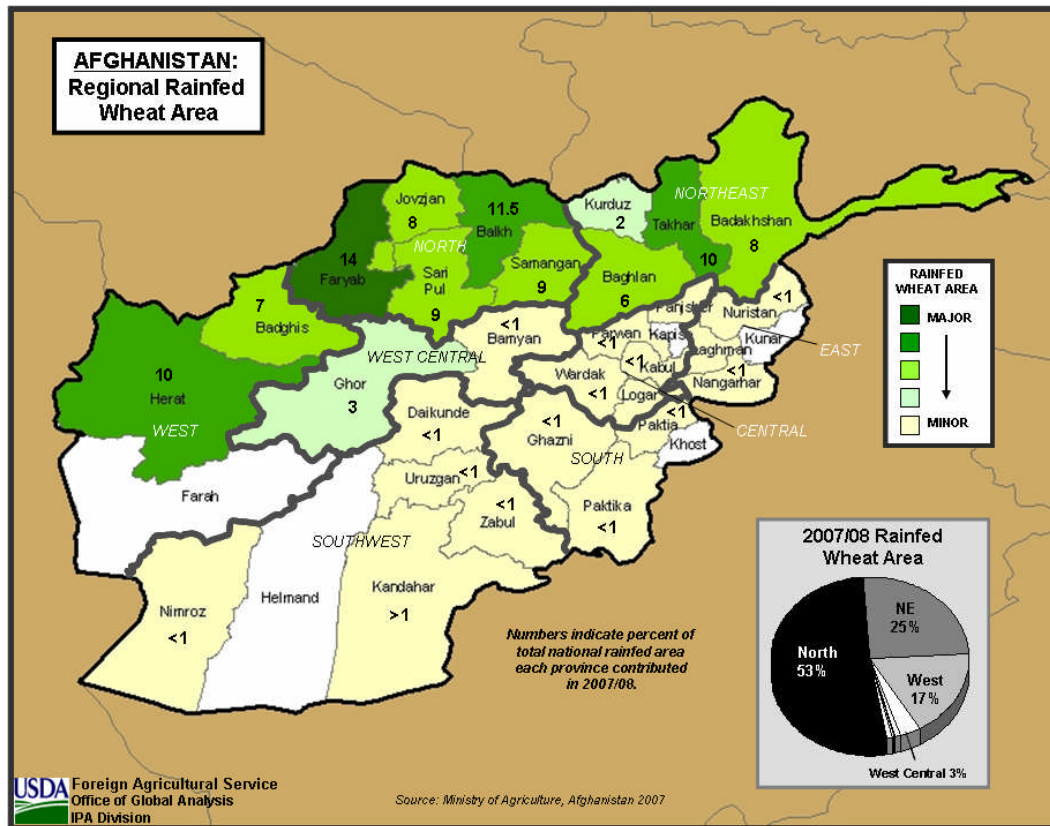
Afghanistan Crop Calendar



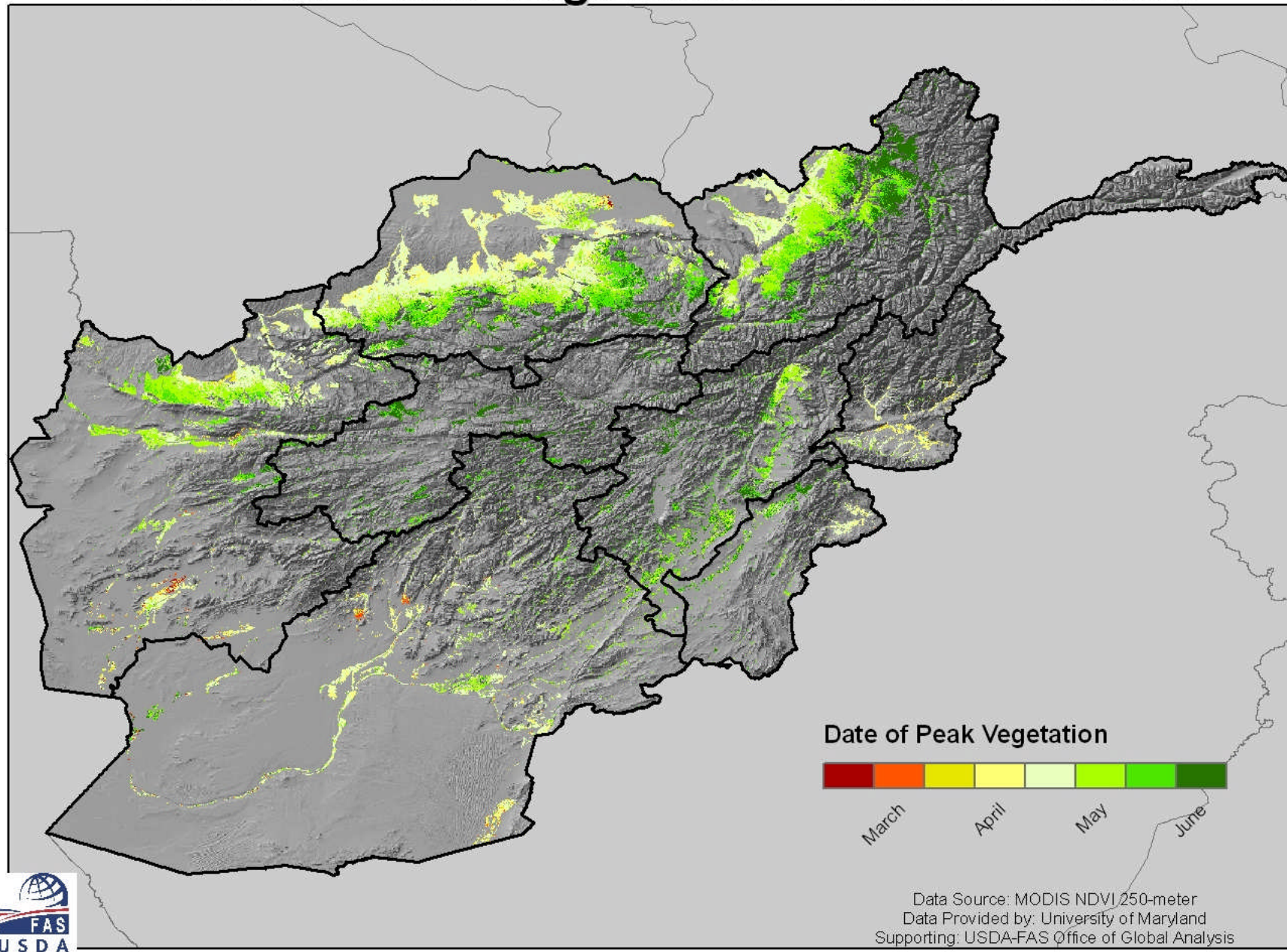
* Calendar represents major production regions. Earlier planting expected in the central highlands.



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Date of Peak Vegetation - Winter Grains



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Joe Fortier | Joseph.Fortier@asrcms.com | (202)720-6652 ASRC

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